Public Hearing Draft
MAY 2007

# Ketchikan Coastal Management Program

## Volume 2: Resource Inventory & Analysis


KETCHIKAN GATEWAY BOROUGH
Department of Planning & Community Development


# Acknowledgements


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Mapping Note: The Ketchikan coastal zone excludes all federal lands and waters within its boundaries. Federal lands and waters are those managed, owned, or held in trust by the federal government. The federal government, however, is not exempt from the ACMP or the Ketchikan Coastal Management Program. Federal law requires "federal agencies, whenever legally permissible, to consider the State management program as supplemental requirements to be adhered t in addition to existing agency mandates

# Table of Contents

# Introduction

With 526 miles of shoreline and approximately 1,752 square miles of land, Ketchikan Gateway Borough's Coastal Management District (district) encompasses an abundance of resources for many different uses and users. The resources include:

- Forest and timber lands
- Rivers, streams, and lakes
- Estuaries, offshore areas, wetlands, and tide-flats
- Lagoons, rocky islands and sea cliffs
- And fish and wildlife

These resources collectively support a range of activities related to community growth and development. As demand for resources increases, the challenge for federal, state, and local government will be how to allocate them among competing needs.

Established and recent industries in Ketchikan, such as:

- Seafood processing, mari-culture and ship repair
- Timber harvest and processing
- Tourism and recreation
- And commercial service providers

Sometimes compete for the resource needs of:

- Homeowners, and small businesses
- Sport and commercial fisheries
- Subsistence users and fish and wildlife management
- And cultural preservation activities

An update to the existing Coastal Management Plan (CMP) is necessary to lend a local perspective on the use of coastal resources in the district and to establish policies that balance and manage the competition for these needs. In addition, the plan update aims to increase the predictability and efficiency of local permit review, inform state and federal regulators what uses the Borough anticipates, and demonstrate that the community understands the positive and negative impacts of uses and has planned for how those uses will be developed.

## Background and Purpose of Plan Update

In 1972, the U.S. Congress passed the federal Coastal Zone Management Act. Congress intended to create a *"partnership between state and local governments in the planning and management of coastal resources."* Thirty-five states with coastal waters were encouraged to develop a Coastal Management Program. To gain state support, Congress incorporated several incentives in the act, including federal financial assistance for planning, federal aid in coastal land acquisition, and a development permit review provision (consistency review) that provided states with a measure of control over federal agency actions once the state's CMP was approved.

In 1977, the State of Alaska passed the Alaska Coastal Management Act. Since that time, Alaska has administered coastal planning under the direction of the Alaska Coastal Policy Council (CPC), which comprises the commissioners of five state departments, the Director of the Office of Management and Budget, and nine elected government officials from the state's local coastal

districts. In 2003, the Act was amended to, among other changes, eliminate the CPC and put the Department of Natural Resources in the role previously filled by the CPC.

**AS 46.40.030. Development of District Coastal Management Plans**

(a) Coastal resource districts shall develop and adopt district coastal management plans in accordance with the provisions of this chapter. The plan adopted by a coastal resource district shall be based upon a municipality's existing comprehensive plan or a new comprehensive resource use plan or comprehensive statement of needs, policies, objectives, and standards governing the use of resources within the coastal area of the district. The plan must meet the statewide standards and district plan criteria adopted under AS 46.40.040 and must include

(1) a delineation within the district of the boundaries of the coastal area subject to the district coastal management plan;

(2) a statement, list, or definition of the land and water uses and activities subject to the district coastal management plan;

(3) a statement of policies to be applied to the land and water uses subject to the district coastal management plan;

(4) a description of the uses and activities which will be considered proper and the uses and activities which will be considered improper with respect to the land and water within the coastal area; and

(5) a designation of, and the policies which will be applied to the use of, areas within the coastal resource district which merit special attention.

(b) In developing enforceable policies in its coastal management plan under (a) of this section, a coastal resource district shall meet the requirements of AS 46.40.070, and may not duplicate, restate, or incorporate by reference statutes and administrative regulations adopted by state or federal agencies. (§ 4 ch 84 SLA 1977; § 9 SLA 2003)

The state implements the Alaska Coastal Management Program (ACMP) in 35 coastal districts including: boroughs; unified home rule municipalities; home-rule, first class, and some second class cities; and Coastal Resource Service Areas (CRSAs). Of these, 33 have approved coastal management programs in place. These coastal management programs (CMP's) include a locally approved CMP that is consistent with the ACMP's statewide development standards. District programs may also include special area plans that focus on a particular area, resource, or use issue within the coastal zone and provide possible management solutions.

District plans are reviewed through local, state, and federal processes prior to adoption. First the local government with planning authority in the district must approve the plan, then the State Department of Natural Resources, and finally the Federal Office of Ocean and Coastal Resource Management. Once approved, the local plan has the status of state law and requires that state and federal agencies take actions on local permits consistent with the policies of the local plan and the statewide standards. Although federal lands are not part of the Ketchikan coastal district, federal activities that present impacts on adjacent non-federal lands are not exempt if the sensitive resources have been identified and designated in advance.

The Ketchikan Gateway Borough initiated its Coastal Management Program in 1978 and approved its first CMP in 1984. A minor revision to the plan occurred in 1989. This document, however, represents the first major update to the original plan. An update of the plan is necessary to better reflect contemporary and anticipated needs of coastal resources due to changing industrial, commercial, and residential growth patterns.

## Relationship to Other Planning Efforts - Ketchikan 2020

The CMP update is closely related to an overall planning program launched by the Borough in 1999, called Ketchikan 2020. Ketchikan 2020 combines four related Borough comprehensive planning efforts:

- An update to the Borough's 1984 Coastal Zone Management Plan
- Preparation of a Wetland Development Plan Scope of Work
- An update of the Borough's Comprehensive Plan including specific area plans such as:
    - The Gravina Island Development Plan
    - The Clover Pass Area Plan

While these projects were initially developed as separate projects with funding from various agencies, the Borough Assembly chose to combine them into a single project to realize both cost savings and project coordination.

## Coastal Management Plan Update

The Borough Assembly established the following plan update goals:

- An update of the existing CMP is necessary to make the document a contemporary reflection of current local development goals and objectives, and to provide a forum for discussion of various interests in local coastal district resources.
- An updated plan will serve as the long-term basis for an inter-agency coastal development review process that is predictable, cost-effective, and efficient, and balances private needs for coastal development with larger public goals for coastal resource protection.

The Assembly's approved work plan for this component of the project, consistent with state coastal management statutes, included:

- Establishment of overall needs, objectives, and goals for development and use of coastal resources.
- Designation of the overall boundaries of the plan focus area..
- Inventory of various resources within the coastal boundary area (i.e., the coastal district).
- Analysis of the identified resources.
- Description of the land uses that will be subject to the plan.
- Description and designation of proper and improper land uses.
- Creation of land and water use policies that will be used to determine whether specific uses will be allowed in certain areas under certain conditions.
- Consideration of how the plan will be implemented using methods such as state consistency review, zoning, subdivision, and capital improvement programs.
- Opportunities for effective public participation during the plan development process.

The Alaska State Department of Commerce, Community and Economic Development, along with a Borough matching grant, funded the work.

**11 AAC 114.290. Public Participation**
A district program must document an effective and significant opportunity for public participation in district program development under this chapter.
(Eff. 7/1/2004, Register 170)

Borough staff held a number of public meetings, and developed each component of the plan separately. The resource inventory, resource analysis, issues, goals, and objectives scoping reports, and plan maps were presented previously to the Planning Commission, the Borough Assembly, and to the public at numerous open houses and workshop meetings. All comments received from elected officials and the public have been incorporated into this draft.

To update the issues, goals, and objectives of the CMP, the borough held formal and informal public meetings to gain public input on community issues and concerns. The Ketchikan 2020 project was first introduced to the public on October 6, 1999 at a planning fair at the Ted Ferry Civic Center held in association with the Gravina Access Project. State and federal agencies and

the Borough provided information to the public on the various planning efforts in Ketchikan. The public was invited to attend by various methods including a mass mailing to all Ketchikan residents, posted meeting flyers, a display ad in the Ketchikan Daily News, and the Gravina Access Project newsletter inserted in the local newspaper. Over 100 residents attended the initial planning fair.

The borough held a series of informal meetings with local civic groups and government entities several days prior to the second public meeting to provide information about Ketchikan 2020 and encourage attendance at the public meeting. Meetings were held with both Rotary Clubs, Historic Ketchikan, Ketchikan Chamber of Commerce, Tongass Conservation Society, Alaska Forest Association, the Borough Planning Commission, the Overall Economic Development Program Committee, the City of Saxman, and with several Borough assembly members.

The Borough Planning Commission hosted the second public meeting (workshop) on December 16, 1999 at the Ted Ferry Civic Center. The sole focus of this meeting was an examination of the issues, goals, and objectives for Ketchikan 2020. Notification for the public meeting was through radio and TV public service announcements, postcards addressed to those on the Ketchikan 2020 mailing list, a display ad in the Ketchikan Daily News, a "brevities" notice in the local newspaper, posted meeting flyers and notice in the second Gravina Access Project newsletter that was mailed to all households in the district. The Borough Assembly, and City of Ketchikan and City of Saxman council members were invited by letter to participate. Over 30 residents attended the public workshop meeting.

Public review and participation opportunities were provided through the following forums:

| Date | Forum | Topic | Results |
|---|---|---|---|
| March 23, 1999 | Planning Commission | Presentation of grant application and proposed scope of work | Approval |
| April 5, 1999 | Assembly | Presentation of grant application and proposed scope of work | Approval |
| August 16, 1999 | Assembly | Contractor selection and award | Approval |
| October 6, 1999 | Ted Ferry Civic Center | Public meeting/workshop focused on issues identification | Collected community opinions on development issues |
| December 13, 1999 | OEDP | Planning issues, goals, and objectives | Collected comments |
| December 14, 1999 | Rotary 2000 | Planning issues, goals and objectives | Collected comments |
| December 14, 1999 | Tongass Conservation Society | Planning issues, goals and objectives | Collected comments |
| December 15, 1999 | Historic Ketchikan | Planning issues, goals and objectives | Collected comments |
| December 15, 1999 | Alaska Forest Association | Planning issues, goals and objectives | Collected comments |
| December 16, 1999 | Ted Ferry Civic Center | Public meeting/work session to develop Issues, Goals, Objectives | Collected community opinions regarding development issues, goals, and objectives |
| January 25, 2000 | Planning Commission | Discussion of Draft Issues, Goals, and Objectives | Collected comments |
| February 7, 2000 | Borough Assembly | Presentation of Draft Issues, Goals, and Objectives | No action. Information item. |
| February 8, 2000 | Planning Commission | Presentation of Draft Issues, Goals, and Objectives | No action. Collected comments |
| March 13, 2000 | OEDP | Presentation of Draft Issues, Goals, and Objectives | No action. Collected comments |
| March 14, 2000 | Planning Commission | Presentation of Draft Issues, Goals, and Objectives | No action. Collected comments |
| April 11, 2000 | Planning Commission | Presentation of Draft Issues, Goals, and Objectives | No action. Collected comments. |
| April 25, 2000 | Planning Commission | Work Session: Resource Inventory | Collected comments |
| May 1, 2000 | Borough Assembly | Approval of Plan Update: Second Year | Approved |
| May 9, 2000 | Planning Commission | Project Update | No action |
| May 15, 2000 | Seafood Processors | Issues, goals, objectives | Collected comments |
| May 16, 2000 | Ted Ferry Civic Center Borough Assembly, City Councils of Ketchikan and Saxman | Project overview in context of Gravina Access | No action. |
| May 23, 2000 | Planning Commission | Work Session: Resource Inventory | No action. Comments collected. |
| September 26-27, 2000 | Ted Ferry Civic Center Planning Commission | Work Session: Gravina Island land use alternatives | No action. Comments collected. |
| January 9, 2001 | Planning Commission | Resource Analysis and Mapping | Draft Approval |
| February 5, 2001 | Borough Assembly | Resource Analysis and Mapping | Draft Approval |
| July 13, 2004 | Planning Commission | Work Session | Review of Draft Public Hearing Draft |
| April 26, 2005 | Planning Commission | Public Hearing | Review of Public Hearing Draft |
| May 24, 2005 | Planning Commission | Public Hearing | Review of Public Hearing Draft |
| December 13, 2005 | Planning Commission | Public Hearing | Review of Final Draft Plan Amendment |
| January 16, 2006 | Borough Assembly | Public Hearing | Postpone pending further review, commen, and revision. |
| February 6, 2006 | Borough Assembly | Public Hearing | Adopted Resolution 1950 approving amended plan. |
| June 28, 2006 | OPMP Preliminary Findings | 30-day Public Review | OPMP Final findings |

Throughout the planning process, planning staff conducted additional meetings with constituent groups, the Planning Commission and Borough Assembly to review and discuss draft materials. These meetings are described in the summary table above. In addition, the Planning Commission advertised the project on every meeting agenda as unfinished business in order to provide the Commission, staff and the public an opportunity to discuss the project.

## Changes to the ACMP and Agency Consultation

In 2003 the Alaska Legislature passed HB 191 mandating sweeping changes to the Alaska Coastal Management Program including changes to state regulations and district coastal management plans. As such the Borough planning process was suspended. In February 2004, the Borough was selected to help "test-drive" the new laws. In March and April of 2004 the Borough was funded to evaluate its draft plan against the new statutes and draft regulations and make the necessary revisions. The revised plan was submitted to the State in June of 2004 and the Borough attended a series of meetings with the Sate agencies June 30 – July 2, 2004.

The State regulations of the Alaska Coastal Management Program became effective July 1, 2004 with subsequent amendments effective October 29, 2004. The Alaska Department of Natural Resources submitted a "*Description Of The Alaska Coastal Management Program, As Amended*" on September 30, 2004 and a revised version on December 16, 2004. Each time the CMP was revised to conform to changes of State laws and subsequent new or refined interpretations.

The Borough's consultant attended the following state-hosted teleconferences on behalf of the Borough during this time.

| Date | Topic |
|---|---|
| June 9, 2004 | Plan Evaluation materials; funding; resources; questions |
| June 17, 2004 | Enforceable Policy Subject Guidance; review packet materials; review FAQs |
| June 24, 2004 | Statutory Requirement for policies; "Unique concern" demonstration; Definitions (scientific evidence, local usage); DEC carve out |
| July 7, 2004 | FAQ's; Valdez plan tables; District Planner's Web Page; habitat policies; Resolutions of Support; Mariculture policies; Log Transfer Facilities |
| July 22, 2004 | Plan Amendment Grant Application; DEPs in designated areas; Avoid, minimize or mitigate; FAQs |
| July 27, 2004 | Plan Amendment Application and Format; Plan Evaluation |
| September 14, 2004 | Mapping and data specifications; District Workshop topics; New FAQs |
| October 5, 2004 | DEPs; Designated Areas; October workshop update |
| December 16, 2004 | Due deference; Federal lands; AMSA's/SAMPs; Designated Areas; Consultation with State and federal agencies; Allowed/Dissallowed and Proper/Improper Uses; Adequately Addressed |
| January 5, 2005 | Decision Tree; Adequately Addressed; OHMP –extent of geographic authority; Additional questions for OPMP (OCS, erosion) |
| January 26, 2005 | "What To Expect" checklist; Model implementation chapters; ACMP and NOAA logos and publication credit; MMS Information Transfer Meeting in Anchorage; Funding sources on ACMP web page |

Borough staff and consultant also attended the Coastal District Workshop, Resources Fair and Agency Consultation Meeting in October 2004. The purpose of this forum was to learn how to revise the CMP to comply with the new laws.

## Final Plan Amendment

This document represents a final plan amendment of the CMP. The plan is being submitted to the Commissioner of DNR for final approval by that agency. Following the anticipated approval by DNR, the plan is concurrently subject to a 90-day review by the federal Office of Ocean and Coastal Resource Management and the Ketchikan Gateway Borough, during which time a public

hearing will be held. A person may comment on the final plan amendment by submitting written comments so that the district receives them within the publicly noticed review and comment period or by testifying in person during the public hearing process. Written comments should be submitted to:

Ketchikan Gateway Borough
Department of Planning and Community Development
ATTN: Coastal District Coordinator – Final Plan Amendment Comment
344 Front Street
Ketchikan, Alaska 99901

## Plan Contents and Organization

The plan includes two volumes. Volume One contains all the necessary information to design, review and approve a project. Specifically it includes:

- Enforceable Policies, Designations, Administrative Policies and Best Management Practices
- Maps of Designated areas
- Glossary and Definitions
- Issues of Local Concern, goals and objectives that support the policies.

**11 AAC 114.270. District enforceable policies**. (a) The enforceable policies of a district are legally binding and provide the basis for a determination of consistency with the district plan. (Eff. 7/1/2004, Register 170)

Volume Two provides background information and an inventory and analysis of coastal resources. It provides policy-makers and researchers more in-depth information on the development of the plan or a specific coastal resource. It also provides DNR with the required documentation for the enforceable policies and designations that are included in Volume I. Volume Two includes:

- A description of those resources subject to the district plan;
- Resource Maps;
- An analysis of the impacts of uses and development activities on the resources;
- The methods and authorities used to implement, monitor, and enforce the Ketchikan Gateway Borough district program. The implementation chapter describes the organizational structure of the district, a description of the land and water uses and activities that are subject to the district program, and the uses and activities considered proper or improper within the district's coastal zone.
- An overview of the plan, its background, its relationship to other planning efforts, a review of the plan development process, an explanation of the public hearing review, and the contents of the plan;
- A general overview of the location and setting of the Ketchikan Gateway Borough Coastal Management District, specifically covering the location, population, employment, climate, topography, geology, soils, vegetation, and major land and resource ownership and management.
- Bibliography of resources used in developing the plan.

# Coastal District Boundary

## Location

The Ketchikan Gateway Borough is 679 miles north of Seattle and 235 miles south of Juneau. The Borough consists of Revillagigedo Island, Gravina and Pennock Islands, and many smaller islands dispersed throughout the region. The total area is approximately 1,752 square miles. Most of the land is within the Tongass National Forest. Tongass Narrows separates Revillagigedo Island from Gravina and Pennock Islands.

**11 AAC 114.220. Coastal Zone Boundaries**

**(a)** A district program must include, in a manner sufficient for district program development and implementation, a map and description of the boundaries of the coastal zone subject to the district program. The boundaries must be within or coterminous with the district and must enclose those lands that would reasonably be included in the coastal zone and subject to the district program if those lands were not subject to the exclusive jurisdiction of the federal government.

**(b)** Initial coastal zone boundaries must be based on Biophysical Boundaries of Alaska's Coastal Zone (1978), reprinted January 1985, adopted by reference, and must include the zone of direct interaction and the zone of direct influence.

**(c)** Final coastal zone boundaries may diverge from the initial boundaries if the final boundaries

**(1)** extend inland and seaward to the extent necessary to manage a use or an activity that has or is likely to have a direct and significant impact on marine coastal water; and

**(2)** include all of the following areas within the district:

**(A)** transitional and intertidal areas, salt marshes, saltwater wetlands, islands, and beaches; and

**(B)** areas that are likely to be affected by or vulnerable to sea level rise.

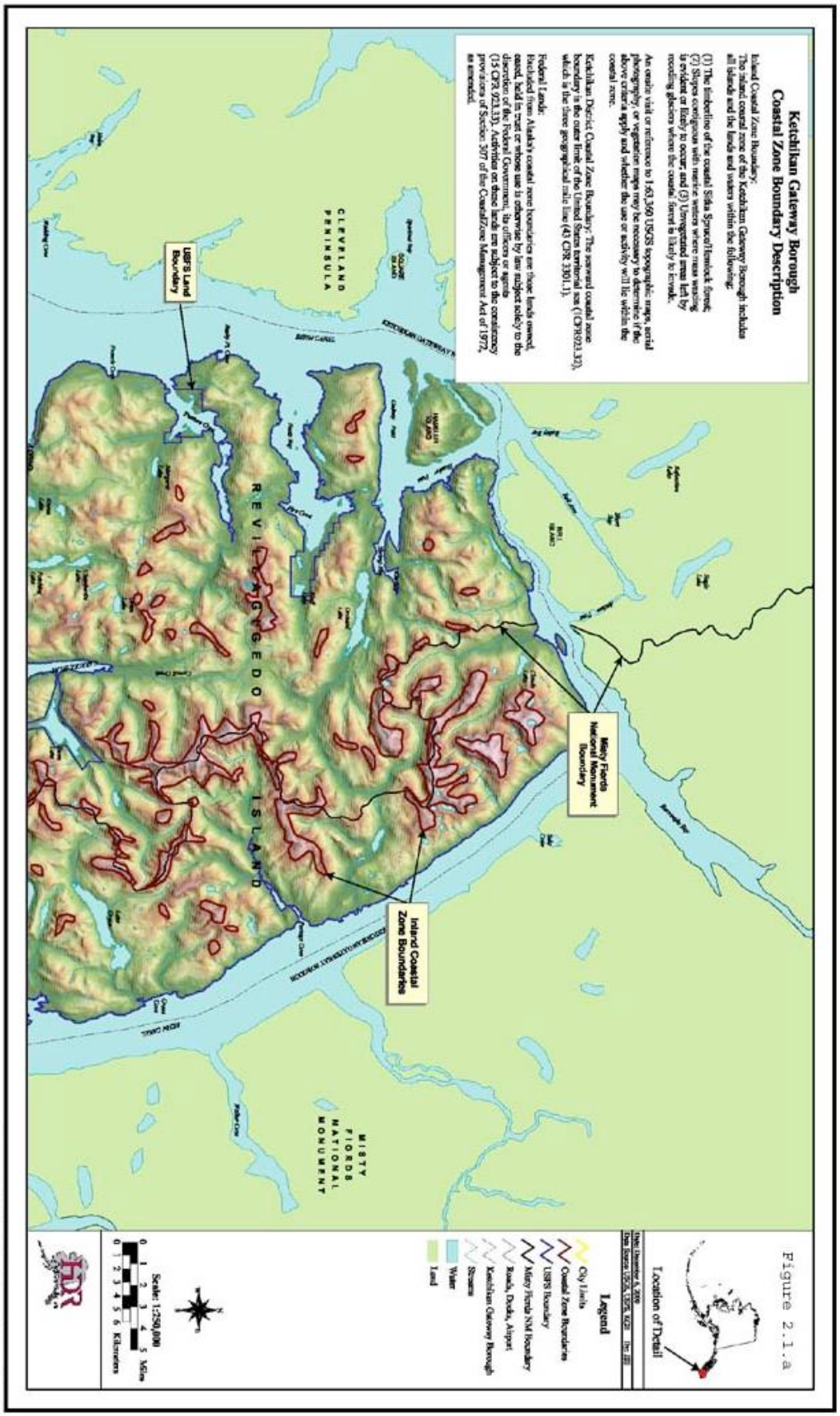
**(d)** If the criteria in (c) of this section are met, final coastal zone boundaries may be based on political jurisdiction, cultural features, planning areas, watersheds, topographic features, uniform setbacks, or the dependency of uses and activities on water access.

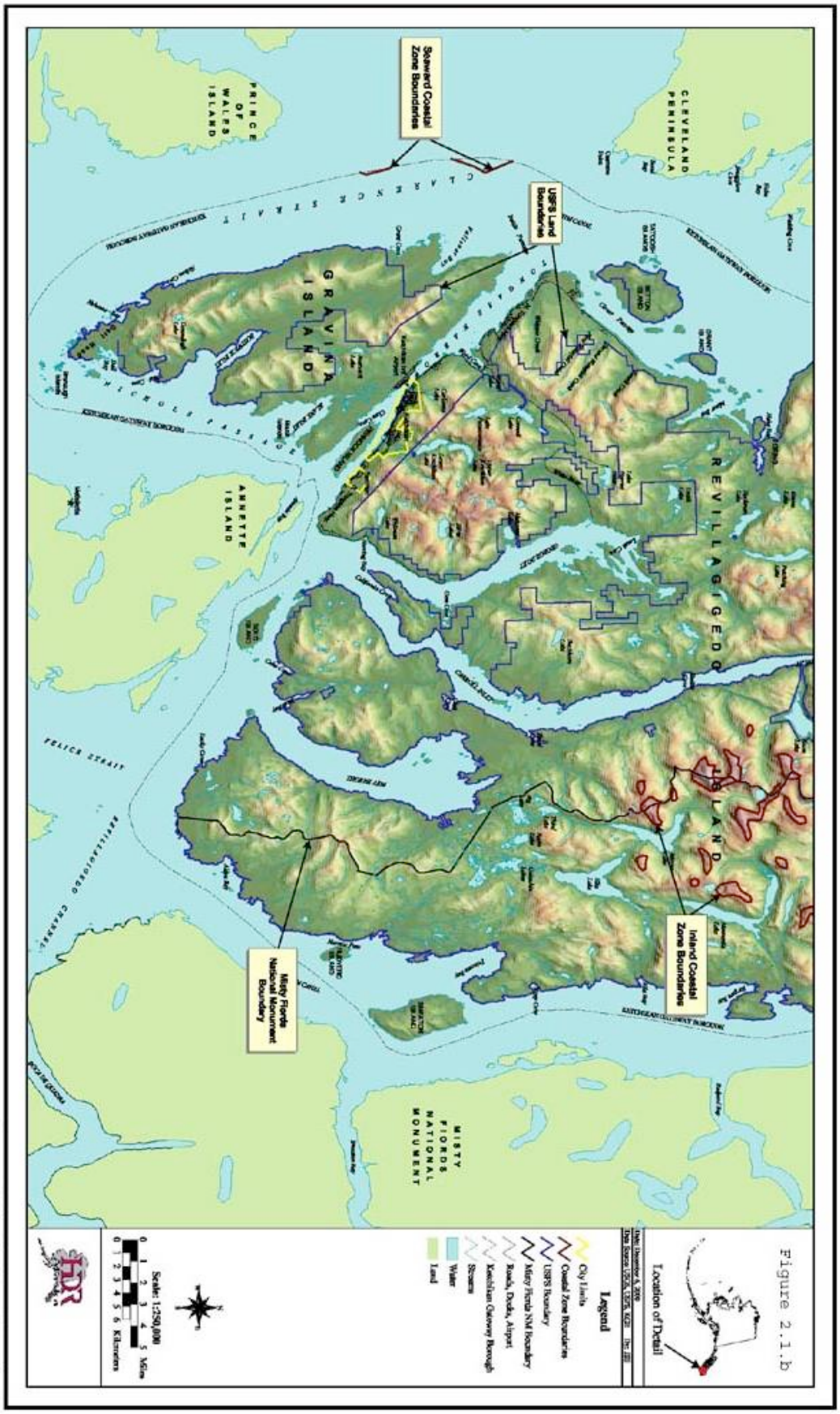
**(e)** The coastal zone boundaries must be sufficiently compatible with those of an adjoining coastal zone to allow consistent administration of the Alaska coastal management program.

**(f)** Notwithstanding any other provision of this section, coastal zone boundaries approved by the former Coastal Policy Council under former 6 AAC 85.040 and 6 AAC 85.150 and the United States Department of Commerce under former 6

## Coastal District Boundary

According to Alaska law (11 AAC 114.220), the district program must include a map and a description of the boundaries of the coastal zone subject to the district program. *Figure 2.1.a* and *2.1.b* depicts the Ketchikan Gateway Borough Coastal District Boundaries. The boundaries extend inland and seaward to the extent necessary to manage those uses and activities that have, or are likely to have, a direct and significant impact on marine coastal waters. The district boundary includes all transitional and inter-tidal areas, salt marshes, saltwater wetlands, islands, and beaches and areas that are likely to be affected by or vulnerable to sea level rise. The inland coastal boundary is the timberline of the coastal Sitka spruce/hemlock forest; slopes contiguous with marine waters where mass wasting is evident or likely to occur; and unvegetated areas left by receding glaciers where the coastal forest is likely to reestablish. The approximate location of the inland boundary is shown in the district boundary figures (*Figures 2.1.a* and *2.1.b*). The seaward coastal zone is the political jurisdiction boundary of the Ketchikan Gateway Borough. The boundary approximates the centerline of Behm Canal, Clarence Straight, and Nichols Passage. Excluded from the coastal zone are "those lands owned, eased, held in trust, or whose use is otherwise by law subject solely to the discretion of the Federal Government, its officers, or agents" (15 CFR 923.22). Plan users should also consult Ketchikan Map No. 116 or the most up-to-date coastal boundary map, available at http://www.alaskacoast.state.ak.us/GIS/11x17Maps/ketchikan.jpg.


Ketchikan Gateway Borough
Coastal Zone Boundary Description
Inland Coastal Zone Boundary:
The inland coastal zone of the Ketchikan Gateway Borough includes all islands and the lands and waters within the following:
(1) The landward line of the coastal Sitka Spruce/Hemlock forest, to evident or likely to occur, and (3) Unvegetated areas left by receding glaciers where the coastal forest is likely to invade.
An onsite visit or reference to 1:63,360 USGS topographic maps, aerial photography, or vegetation maps may be necessary to determine if the above criteria apply and whether the use or activity will lie within the coastal zone.
Ketchikan District Coastal Zone Boundary: The seaward coastal zone boundary is the outer limit of the United States territorial sea (15CFR923.32), which is the three geographical mile line (43 CFR 3301.1).
Federal Lands:
Excluded from Alaska's coastal zone boundaries are those lands owned, leased, held in trust or whose use is otherwise by law subject solely to the discretion of the Federal Government, its officers or agents (15 CFR 923.33). Activities on these lands are subject to the consistency provisions of Section 307 of the Coastal Zone Management Act of 1972, as amended.
USFS Land Boundary
Misty Fiords National Monument Boundary
Inland Coastal Zone Boundaries
CLEVELAND PENINSULA
REVILLAGIGEDO ISLAND
MISTY FIORDS NATIONAL MONUMENT
Figure 2.1.a
Location of Detail
Legend
City Limits
Coastal Zone Boundaries
USFS Boundary
Misty Fiords NM Boundary
Roads, Docks, Airport
Ketchikan Gateway Borough
Streams
Water
Land
Scale: 1:250,000
Miles
Kilometers
Proposed District Boundary: North




Proposed District Boundary: South

# Issues, Goals, Objectives, and Enforceable Policies

## Coastal Development

**Issues of Local Concern:** Ketchikan recognizes that the waterfront is a limited and economically valuable resource and that it is in the public's interest to manage the coast for those industrial, commercial, or recreational uses that depend upon direct waterfront access

.

- There is a limited supply of road accessible waterfront land suitable for the establishment of industrial and commercial uses that depend upon access to the water.
- Due to the limited supply of waterfront land to meet community growth needs, it is often difficult to find development alternatives that fulfill state and federal agency requirements to avoid and minimize impacts to fish and game habitat, streams, estuaries, and wetlands.
- There is a limited supply of flat, well-drained upland areas suitable for industrial and commercial development.
- The competition and concentration of residential, recreational, industrial, and commercial uses along the limited shoreline and road system can result in conflicts between different land uses.
- Areas most suitable for community development may also contain high natural resource values such as habitat, streams, estuaries, and wetlands.
- Shoreline development defines the community's appearance and scale and affects access to the coast.
- Site development is expensive due to the community's steep, rocky terrain.

**Statewide Standards**

***11 AAC 112.200. Coastal Development***

**(a)** In planning for and approving development in or adjacent to coastal waters, districts and state agencies shall manage coastal land and water uses in such a manner that those uses that are economically or physically dependent on a coastal location are given higher priority when compared to uses that do not economically or physically require a coastal location.

**(b)** Districts and state agencies shall give, in the following order, priority to

**(1)** water-dependent uses and activities;

**(2)** water-related uses and activities; and

**(3)** uses and activities which are neither water-dependent nor water-related for which there is no

**Goal 1: Accommodate the waterfront land needs of water dependent and water related development activities. (See Policies CD-1, CD-3)**

**Objective 1.A:** Zone, acquire, retain, and otherwise provide for use of the most suitable waterfront lands for water-dependent and water-related uses. (See Policies CD-1, CD-3)

**Objective 1.B:** Give priority to those waterfront development activities that require direct access to the waterfront. (See Policy CD-1, CD-3)

**Objective 1.C:** Increase public access to coastal shorelines and views. (See Policy CD-1, CD-3, CD-4, RCA-3, RCA-4, RCA-6, RCA-7, RCA-8, RCA-9)

**Objective 1.D:** Reduce the demand for waterfront land by zoning suitable upland parcels for establishment of non-water dependent commercial and residential uses such as homes, offices, retail sales, public schools, and institutional uses. (See Policy CD-8)

**Goal 2: Meet Ketchikan's social and economic needs through the balanced use of coastal resources. (See Policies CD-1, CD-2, CD-3)**

**Objective 2.A:** Provide for the reasonable use of public and private property while managing the community's shoreline for navigation, public access, and habitat value. (See Policies CD-1, CD-2, CD-3, CD-4)

**Objective 2.B:** Use zoning, subdivision, and other land use regulations, as well as land acquisition, to organize the limited land base in a manner that maximizes public and private benefits while minimizing land use conflicts. (See Policies CD-2)

**Goal 3: Maintain the natural beauty, scenic vistas, and working waterfront that contribute to Ketchikan's value as a place to live, work, and visit. (See Policies CD-1, CD-3, RCA-3, RCA-4, RCA-6, RCA-7)**

**Objective 3.A:** Produce specific land use plans and development criteria for areas of high value to the general public. (See Policies CD-5)

**Objective 3.B:** Use best management practices as a tool to shape the character and quality of development. (See Policies CD-10 - 20)

## Coastal Development Enforceable Policies

### CD-1: Prioritization of Waterfront Land Use

A. Water-dependent uses include: fish hatcheries; mariculture activities; fish processing; log storage and transfer; float plane bases, boat harbors, freight, fuel, or other docks; marine-based tourism facilities; boat repair, haul outs, marine ways, and accessory attached housing; remote recreational cabins dependent on water access; and facilities that serve as inter-modal transportation links for the transfer of goods and services between the marine transportation system and the road system.
B. Water-related activities include: marine retail stores and commercial activities such as hotels, restaurants, and other similar uses that provide views and access to the waterfront.
C. Uses and activities that are neither water dependent or water related for which there is not practicable inland alternative shall be located in sites where water-dependent or water related uses or activities are not practicable due to shallow bathymetry or unusual lot characteristics such as substandard size, frontage, or steep topography.

### CD-2: Structures Placed in Navigable Waters

Placement of piling-supported or floating structures in coastal waters shall be subject to the following standards:

A. Use of structures shall be consistent with the allowable uses on the adjacent uplands.
B. Structures shall not be treated with exteriorly applied creosote preservative coatings.

## CD-3: Tideland Fill Below Mean High Water

Piling supported or floating structures shall be used for construction below mean high water unless clear and convincing evidence shows that all of the following conditions exist. For the following conditions, "reasonable use" means consistent with local zoning and special areas plans. "Reasonable use" does not mean developed to the maximum extent practicable.

A. There is a documented public need for the proposed activity as expressed in locally adopted plans, studies, policies, standards, public opinion surveys and public testimony;
B. There are no practicable inland alternatives that would meet the public need and allow development away from the waterfront;
C. Denial of the fill would prevent the applicant from making a reasonable use of the property;
D. The fill is placed in a manner that minimizes impacts on adjacent uses, public access easements along the shoreline and water views as identified on Map Figure 3.35;
E. The fill is the minimum amount necessary to establish a reasonable use of the property; and
F. Development of the property would support a water dependent use.

## Recreation and Coastal Access

**Issues of Local Concern:** Summary: Recreation is an important asset to local residents and to the visitor industry. Recreation facilities and opportunities attract visitors and provide local employment and important economic, health and social benefits. The challenge is to maintain quality recreational experiences for residents while enhancing opportunities for the visitor industry. Improvement of public access to outdoor recreation areas via new roads, pedestrian and bike trails, and public docks are principal issues along with the need to extend the visitor season into the winter months.

**Statewide Standards**

***11 AAC 114.250. Subject uses, activities, and designations***. (c) A district shall consider and may designate areas of recreational use. Criteria for designation of areas of recreational use are
(1) the area receives significant use by persons engaging in recreational pursuits; or
(2) the area has potential for recreational use because of physical, biological, or cultural features.
(d) A district shall consider and may designate areas of tourism use. Criteria for designation of areas of tourism use are the area receives or has the

### Goal 1: Maximize recreation opportunities for local residents and visitors. (See Policies RCA-1 through 6)

**Objective 1.A:** Designate important recreation areas in the Borough.

**Objective 1.B:** Use zoning, subdivision, best management practices and land acquisition to manage recreational areas in a manner that maximizes

local and visitor benefits while minimizing conflicts with other land uses.

**Objective 1.C:** Designate and protect recreational areas that are important assets for the visitor industry.

**Objective 1.D:** Recognize the scenic values of suitable timberlands viewed from selected popular roads, trails, marine travel routes, recreation sites, bays, and anchorages, and modify timber harvest practices accordingly.

**Objective 1.E:** Expand winter recreation opportunities by developing new facilities and enhancing existing ones.

**Objective 1.F:** Coordinate and co-sponsor activities with local, state and federal agencies to broaden the scope of recreation services.

**Goal 2: Improve access to existing and potential recreation areas. (See Policies RCA-1, RCA-6 through 9)**

**Objective 2.A:** Develop pedestrian walkways, bike routes, and overlooks.

**Objective 2.B:** Include bicycle and pedestrian routes when constructing new roads and major improvements to existing public roads.

**Objective 2.C:** Improve and increase boat, canoe, and kayak launching facilities throughout the road system.

**Objective 2.D:** Provide additional recreational opportunities through the construction of new roads.

**Objective 2.E:** Develop a coastal trail along the airport reserve.

**Objective 2.F:** Provide a safe, efficient, and scenic pedestrian and bicycle transportation by constructing a series of parks, waypoints and rest areas connected by trails between Settlers' Cove and Herring Cove.

**Objective 2.G:** Complete construction of the trail network approved in the Trails Ketchikan Plan.

**Objective 2.H:** Support the volunteer efforts of the Ketchikan Outdoor Recreation and Trails Coalition.

## Recreation and Coastal Access Enforceable Policies

### RCA-1: Management of Designated Recreational Areas

Proposed uses or activities in the Designated Recreational Areas as depicted on the maps titled Areas Designated for Recreation Use (Figures 3.2-3.33) shall avoid or minimize direct and significant impacts upon the existing activities and the physical, biological, visual or cultural features upon which the recreation depends (shown as protected features in the table 4.2 of Designated Recreational Areas.)

**Statewide Standards**

*11 AAC 112.220. Coastal access.* Districts and state agencies shall ensure that projects maintain and, where appropriate, increase public access to, from, and along coastal water. (Eff. 7/1/2004, Register 170)

## RCA-2: Visually Important Backdrops and Visual Points of Interest within the Clover Pass Area

Designated Visually Important Backdrops and Points of Interest are depicted on Map Figures 3.2, 3.7-3.13, 3.27 and 3.33 for the Clover Pass area. Scenic impacts to important backdrops and points of interest within the Clover Pass Area shall be avoided or minimized through use of coastal development best management practices included in Appendix C. Site clearing and re-grading of important backdrops and points of interest within the Clover Pass Area shall be minimized to the extent practicable.

## RCA-3: Recreation Buffers

Designated sites for lodges, resorts and marinas in the designated recreational use areas are depicted on Map Figures 3.10, 3.12, 3.21, 3.24, 3.27, 3.28 and 3.31-3.33. Natural or vegetative buffers shall be required on these sites to avoid or minimize conflicts and protect views. Requirements for the size and extent of buffers shall be determined on a case by case basis and shall be commensurate with the reasonably foreseeable impacts of the development on adjacent uses and activities.

## RCA-4: Whitman Creek

As depicted on the map titled Areas Designated for Recreation Use (Map Figure 3.25), George Inlet near Whitman Creek is designated as a Recreation Use Area for the Tongass Coast Aquarium. Uses and activities within the designated area shall be sited to avoid, minimize, or mitigate impacts to operations and public access to and around the aquarium site.

## RCA-5: Public Access to Coastal Water

Within designated recreational use areas that are adjacent to coastal water (map figures 3.2-3.16, 3.20-3.30, 3.32-3.34), it shall be considered appropriate to increase public access from the uplands within the designated recreational use area to, from, and along coastal water through easements, dedications, or other means of conveyance, except where human health or safety would be at risk.

## RCA-6: Public Access in Designated Areas

Within designated recreational use areas (map figures 3.2-3.33), water access to, from and along lakeshores, streams, shorelines, tidelands, estuaries and saltwater wetlands for recreational use shall be increased, through easements, dedications, or other means of conveyance, except where human health or safety would be at risk.

## RCA-7: Waterfront Access

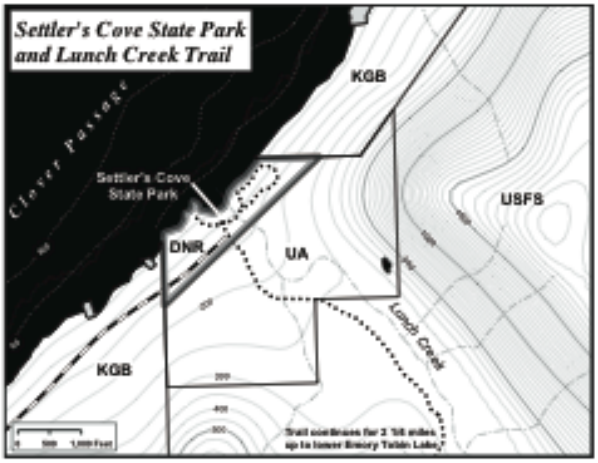
In accordance with 11 AAC 112.220, capital improvements on or adjacent to publicly-owned waterfront property shall be designed to maximize pedestrian access, views to and along coastal waters, and to facilitate public enjoyment of coastal waters. These improvements shall incorporate to the extent practicable promenades, shelters, viewing platforms bike lanes, rest-stops, cultural and geographic interpretive signage, picnic facilities, landscaping and other amenities to enhance public enjoyment of coastal resources. The following types of capital improvements are exempt from this policy: utility transmission lines, and utility pipelines.


Clover Pass Scenic Area
Naha Bay and River System
Otter Ranch
Public Dock
Black Bear Observation Port
Kayaking and Boating
Camping and Beach Combing
Shelter Island
Lunch Falls Loop Trail
Moser Bay Estuary
Lunch Creek Trail
Boating and Sport Fishing
Harriet Hunt Lake
REVILLAGIGEDO ISLAND
Marinas
Guard Islands
Coast Guard Beach Trail
Whipple Creek Area Hiking, RTV's and Berry Picking
Camping, Hiking, Fishing
Ward Lake Rec. Area
South Point Higgins Beach
Tatoosh Pole Park and Clan House
Ward Creek Trail
Tatoosh Bight State Park
Perseverance Trail
Bruce St. Trail
Downtown Historic Area and Shopping
Silvis Lake Trail
Minerva St. Trail
Lewis Creek
Ketchikan
Achilles St. Trail
Dall St. Trail
High Mountain Viewpoint and Ridge Trail
Proposed Coastal Trail
Gravina Creek
Upper Grant Cove Old Growth Reserve and Roadless Area
Bear, Fish and Bird Viewing, Sport Fishing
Saxman
Saxman Totems Park
Rotary Beach
GRAVINA ISLAND
Totems Pole Park, Clan House and Carving Shed
Fishing, Whale Watching, Scuba Diving, Boat Launch
Nicole St. Old Growth Reserve and Roadless Area
Dall Ridge Trail
CLARENCE STRAIT
BEHM CANAL
CARROLL INLET
TONGASS NAT'L FOREST
Index Map of Areas Used for Recreation and Coastal Access, 2005
Map Figure 3.1
Prepared by Resource Data Inc. for the Ketchikan Gateway Borough Dept. of Planning and Community Development

*Areas Used for Recreation*

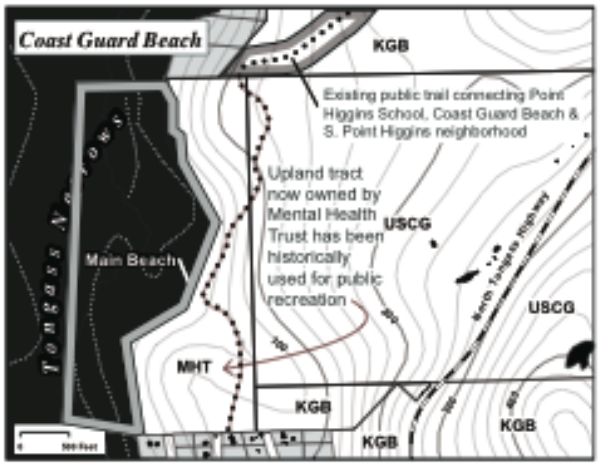

### 3.2 Settler's Cove State Park

**Description:** 33.8 acres including 1/2 mile of diverse shoreline, Lunch Creek estuary and waterfall.
**Access**: N Tongass Hwy (land), Clover Pass (water)
**Primary Uses**: Swimming, beachcombing, walking, hiking, SCUBA, kayaking (good launch site), camping, picnicking, shoreline fishing, Beach Day (local schools), birdwatching & wildlife viewing
**Community Interests/Values**: One of area's best beaches, accessibility and use by people of all age groups/physical condition; access point for Lunch Creek trail to Emory Tobin Lakes, and proposed Borough shoreline trail along south Clover Pass.
**Protection Status**: Designated State Park
**Notes/Comments**: Upland U of A tract (207 acres) now considered park expansion.
**Applicable Policies:** RCA-1, 2, 5, 6 and 7



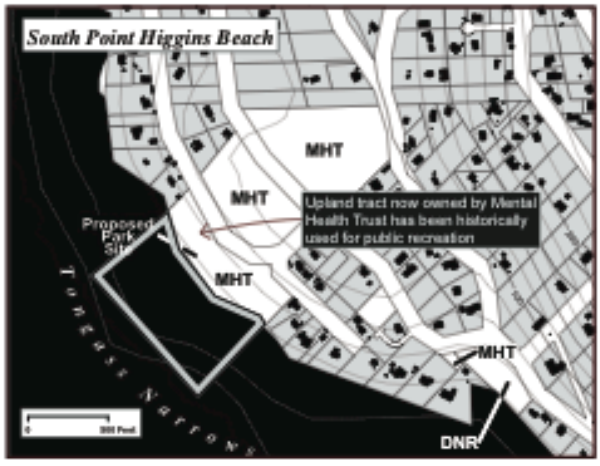

### 3.3 Coast Guard Beach

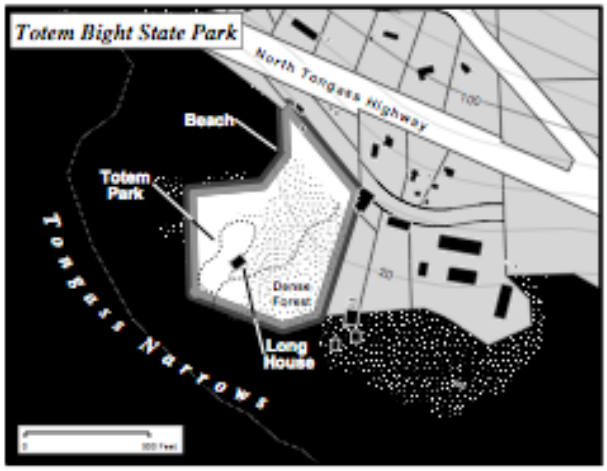
**Description:** 0.86 miles of shoreline.
**Access**: Point Higgins trail & S. Point Higgins Road (land), Clover Passage (water, exposed conditions)
**Primary Uses**: Swimming, beachcombing, walking (neighborhood residents), hiking, kayaking, camping, Survival Camp (Ketchikan Schools)
**Community Interests/Values**: Beach and uplands used by school, neighborhood and area residents
**Protection Status**: Uplands owned by Mental Health Trust (development may impact public access)
**Notes/Comments**: Formal designation of uplands and beach as a park has been a community priority since first adopted in the 1976 Comprehensive Plan; opportunity to develop some uplands while maintaining public access to shoreline.
**Applicable Policies:** RCA-1, 5, 6 and 7




### 3.4 South Point Higgins Beach

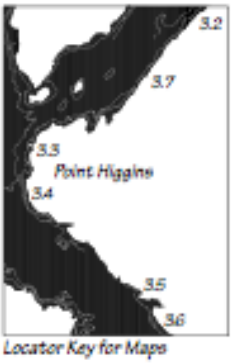
**Description:** 1,260 ft. rocky beach/intertidal habitat
**Access**: South Point Higgins road (land); Tongass Narrows (water, exposed conditions)
**Primary Uses**: Swimming, beachcombing, walking (neighborhood residents), hiking, SCUBA, kayaking, camping, picnicking, Beach Day (Ketchikan Schools)
**Community Interests/Values**: Neighborhood upland residents' shoreline access; herring spawn beach; limited public shoreline in area
**Protection Status**:Uplands in Mental Health Trust ownership and could be sold
**Notes/Comments**: Uplands parcel/shoreline have long been a priority for neighborhood park.
**Applicable Policies:** RCA-1, 5, 6 and 7



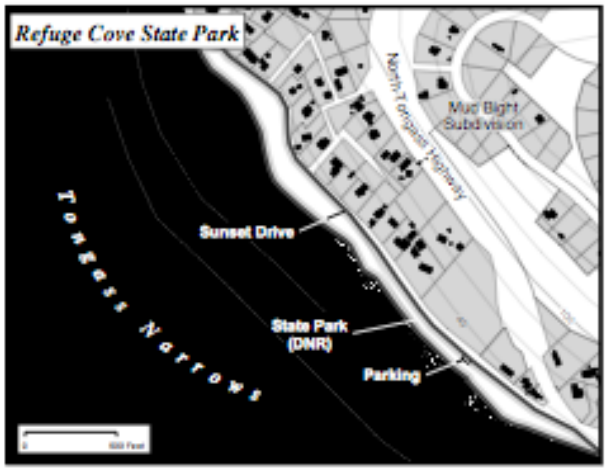



### 3.5 Totem Bight State Park

**Description:** 8.3 acres, almost 1/2 mile of variable shoreline including small beach with model Native Long House, totem park and interpretive information
**Access:** N Tongass Hwy (land); Tongass Narrows (water, with exposed conditions and small cove)
**Primary Uses:** Swimming, beachcombing, SCUBA, kayaking (good launch site)
**Community Interests/Values:** 1 of 3 State Parks on road system; highest visitor numbers and revenue generation unit in State Park system; accessibility and use by people of all age groups and physical conditions; key attraction and part of Ketchikan area tourism product
**Protection Status:** Designated State Park
**Notes/Comments:** Natural forest and site orientation effectively buffers site from surrounding development
**Applicable Policies:** RCA-1, 5, 6 and 7

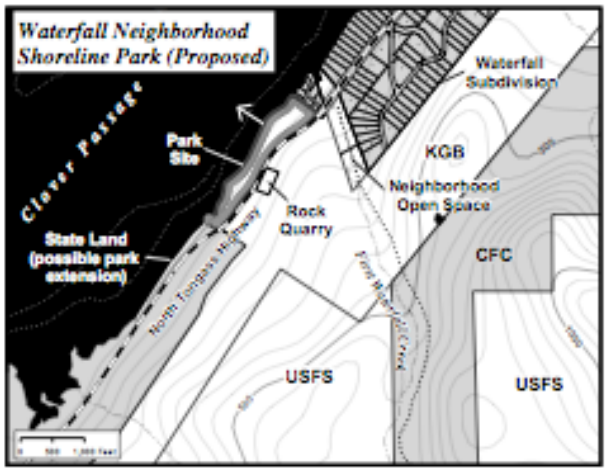


*Locator Key for Maps*




### 3.6 Refuge Cove Beach State Park

**Description:** 0.6 miles of mostly rocky shoreline fringe adjacent to Sunset Drive (mile 8.6 of N Tongass Hwy)
**Access:** Off North Tongass Highway (land); Tongass Narrows (water, with rocky, exposed conditions)
**Primary Uses:** Swimming, beachcombing, SCUBA, kayaking, walking, fishing, Beach Day (schools)
**Community Interests/Values:** Most accessible public shoreline for Refuge Cove neighborhood residents; very quiet, secluded shoreline experience due to distance from highway; neighborhood use and importance to increase as extensive upland lots developed;
**Protection Status:** Designated State Park
**Notes/Comments:** Maintain natural fringe of trees between high water and Shoreline Drive
**Applicable Policies:** RCA-1, 5, 6 and 7



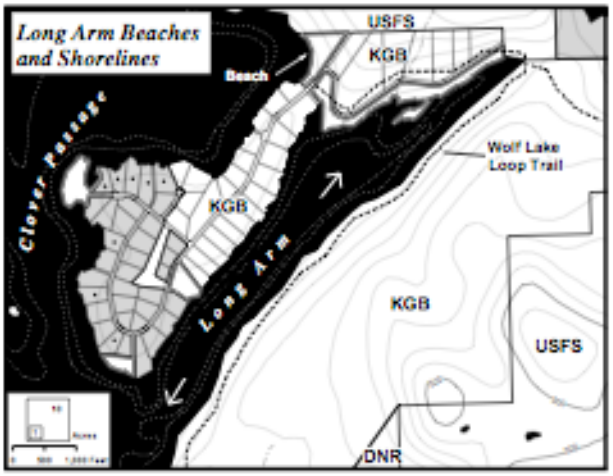

### 3.7 Waterfall Neighborhood Shoreline

**Description:** Approximately .48 miles of Borough-owned shoreline just south of Waterfall subdivision
**Access:** North Tongass Highway (land, near milepost 16); Clover Pass (water, somewhat rocky conditions)
**Primary Uses:** Beachcombing, hiking/walking, possible boat/kayak launch if improvements made
**Community Interests/Values:** Potential shoreline access for N Pt Higgins and Waterfall neighborhoods; helps maintain natural shoreline in Scenic Area
**Protection Status:** Borough land, recommended Public Lands and Institutions (PLI) zone in draft Clover Pass plan and future Borough park
**Notes/Comments:** Difficult site for residential development (steep); existing quarry site could be used for parking; State-owned shoreline immediately to south.
**Applicable Policies:** RCA-1, 2, 5, 6 and 7

*Areas Used for Recreation Continued*

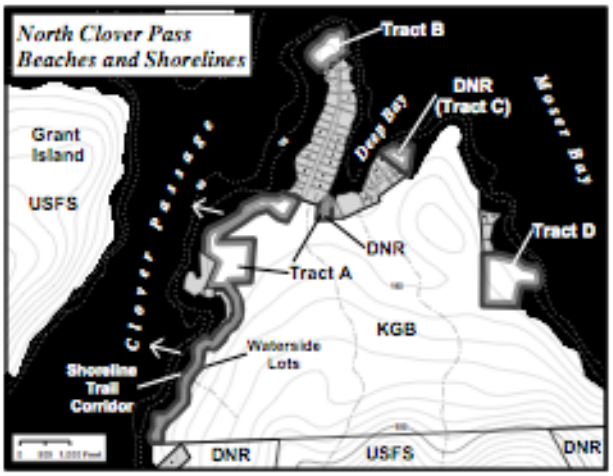
### 3.8 Long Arm Shoreline

**Description:** 6.3 acres waterfront on Long Arm/Clover Pass) with 0.8 mi of walkable shoreline and 3 waterfront tracts (13.6 acres) designated open space in subdivision.
**Access:** Boat or float plane (primarily from Long Arm, access from Clover Pass when water conditions permit)
**Primary Uses:** Beachcombing, hiking, camping, access to non-waterfront parcels, emergency boat moorage, trailhead to Naha & Wolf Creek watersheds
**Community Interests/Values:** Protected waters and beaches of Long Arm make it one of best Clover Pass sites for marina and water accessible recreation; provides water access for upland lots; maintains natural shoreline.
**Protection Status:** Borough-owned land; 3 tracts (B, C, & D) dedicated community park reserves when subdivided; draft Clover Pass plan recommends tract A as Park.
**Notes/Comments:** Existing 10' shoreline easement in subdivision permits shoreline access except where steep.
**Applicable Policies:** RCA-1, 2, 5, 6 and 7



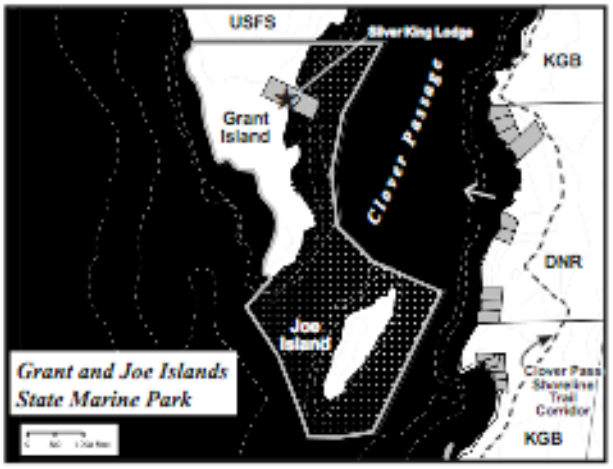

### 3.9 North Clover Pass Open Space

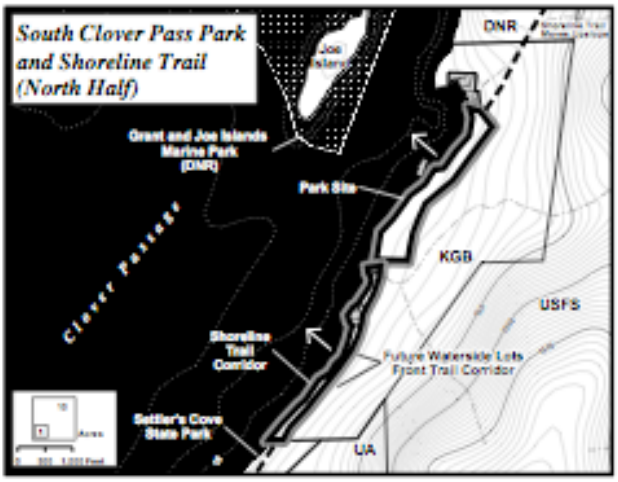
**Description:** Four shoreline tracts fronting on Clover Pass and Moser Bay, with both rocky and sandy beaches.
**Access:** Boat or float plane only (tracts A, C, and D have gentle shoreline conditions and protected waters)
**Primary Uses:** Beachcombing, hiking, camping, resident access to non-waterfront parcels, emergency moorage
**Community Interests/Values:** Provide (non-waterfront lots) access to shoreline; improves value/marketability of future upland properties; some of most protected water sites in Clover Pass; part of proposed shoreline trail.
**Protection Status:** Tract B (Borough-owned) dedicated open space as part of subdivision; Tract C State-owned; Tracts A and D both Borough-owned and recommended as future parks in Clover Pass Scenic Area Plan draft.
**Notes/Comments:** Proposed shoreline trail/access 25-50 ft corridor permits development of "waterside" lots and public/neighborhood use of shoreline.
**Applicable Policies:** RCA-1, 2, 5, 6 and 7




### 3.10 Grant & Joe Islands Marine Park

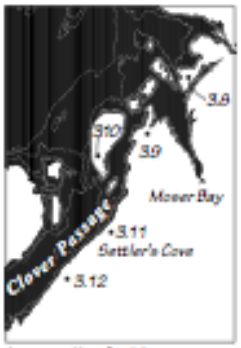
**Description:** Approx. 135 acres south tip of Grant Island and all of Joe Island and 1,387 acres of tidelands/marine waters; diverse shore with beaches & estuarine wetlands.
**Access:** Boat and float plane only **Primary Uses:** Kayaking, beachcombing, SCUBA, walking/hiking, boating, camping, fishing, swimming
**Community Interests/Values:** High recreation use, key destination on proposed Clover Pass kayak trail); significant herring spawning in spring; provides attractive natural setting for commercial fishing lodge and backdrop for residents and visitors on Revilla side.
**Protection Status:** State owned lands, proposed addition to State Marine Park system.
**Notes/comments:** Semi-remote rec management classification for north Grant Island (USFS lands) permits small scale rec/tourism facilities such as cabins and docks.
**Applicable Policies:** RCA-1, 2, 3, 5, 6 and 7




### 3.11 S. Clover Pass Park & Shoreline Trail (north)

**Description:** 36 acres with 1.5 miles (avg. 50' width) of shoreline just north of Settler's Cove State Park; includes some of the best remaining Clover Pass public beach sites
**Access:** Currently by boat, float plane, or unimproved hiking trails from Lunch Creek (rocky shoreline) .
**Primary Uses:** Beachcombing, hiking/walking, kayaking
**Community Interests/Values:** part of proposed Clover Pass shoreline trail system which enables hiking from 2nd Waterfall Creek to Moser Bay; protects few remaining public beaches; provides shoreline access for future upland lots; protects natural character of shoreline.
**Protection Status:** Borough-owned land; park/shoreline trail proposals in draft Clover Pass plan not yet adopted
**Notes/Comments:** Proposed shoreline trail 25-50 ft corridor allows "waterside" lots; trail alignment moves upland to avoid private property and/or difficult terrain.
**Applicable Policies:** RCA-1, 2, 5, 6 and 7



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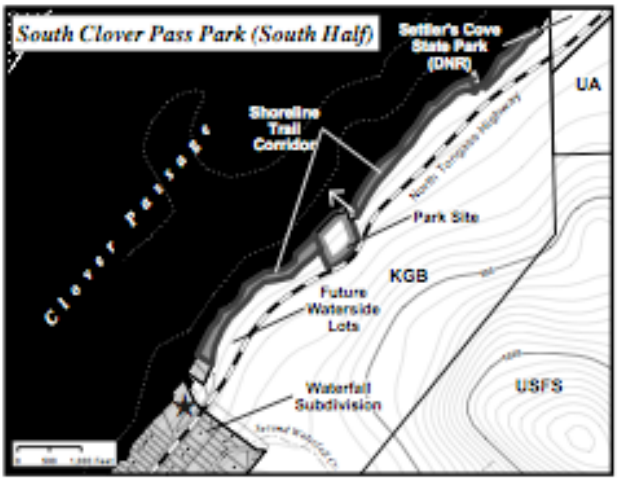
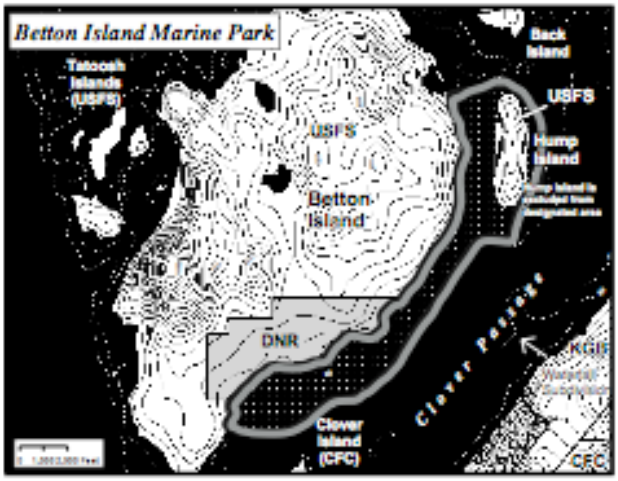



### 3.12 S. Clover Pass Park & Shoreline Trail (south)

**Description:** Approximately 36 acres with 1.6 miles (avg. 50' width) of shoreline south of Settler's Cove State Park, generally rocky shoreline with a few small sandy beaches.
**Access:** North Tongass Highway (land) and Clover Passage (water, but generally rocky shoreline conditions)
**Primary Uses:** Beachcombing, hiking/walking, kayaking.
**Community Interests/Values:** (same as for 3.11 above)
**Protection Status:** All land (except for three small lots) is currently in Borough ownership; park and shoreline trail recommendations included in draft Clover Pass Scenic Area plan to be formally adopted by Borough Assembly
**Notes/Comments:** Primary use of proposed park would be to provide water access for non-waterfront properties.
**Applicable Policies:** RCA-1, 2, 3, 5, 6 and 7



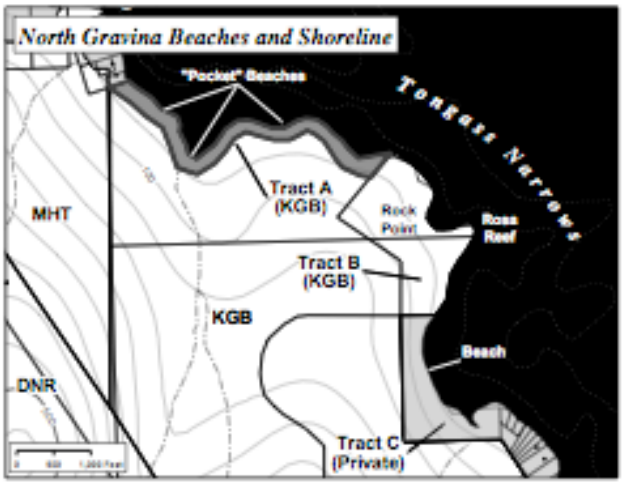

### 3.13 Betton Island Marine Park & Loop Trail

**Description:** 280 acres of land and 408 acres of tidelands and marine waters, including rocky and gentle sandy beaches, intertidal and upland habitat on the SE side of Betton Island and marine waters on the eastern side.
**Access:** Boat and float plane only
**Primary Uses:** Kayaking and boating, beachcombing, SCUBA, walking, hiking, camping, fishing, hunting, birdwatching/wildlife viewing, commercial guide activity
**Community Interests/Values:** The SE shoreline of Betton Island is an important natural visual backdrop for N. Pt. Higgins, Waterfall and future neighborhoods; significant herring spawning in spring; prime winter deer habitat; greatest ecosystem diversity of Clover Pass islands.
**Protection Status:** Proposed State Marine Park addition
**Notes/Comments:** Entire island to remain in public ownership, with USFS managing its lands for recreation.
**Applicable Policies:** RCA-1, 2, 5, 6 and 7

*Areas Used for Recreation Continued*

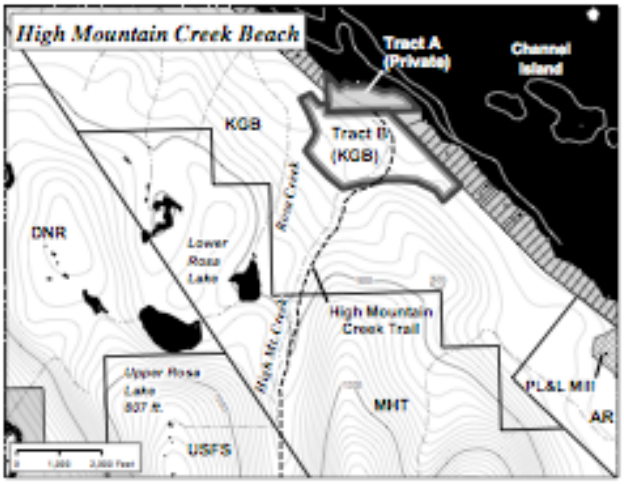
### 3.14 North Gravina Beaches

**Description:** Over 1.5 miles of Borough-owned shoreline including longest protected beach on N. Gravina as well as smaller, more exposed "pocket" beaches.
**Access:** Boat or float-plane (shoreline conditions variable); road access expected in future as N. Gravina road extended; bay south of Rosa Reef good marina site.
**Primary Uses:** Beachcombing, hunting, fishing, camping.
**Community Interests:** Includes best N. Gravina beaches; remaining shoreline privately owned; enables shoreline trail; best site for park serving N. Gravina residents.
**Protection Status:** Tract A is Borough owned; Gravina Island plan proposes re-zoning PLI for recreational use.
**Notes/Comments:** Tracts B and C also have excellent beach and shoreline conditions, Gravina Plan recommends re-zoning to Planned Development to retain beach access while allowing for residential/commercial development.
**Applicable Policies:** RCA-1, 5, 6 and 7



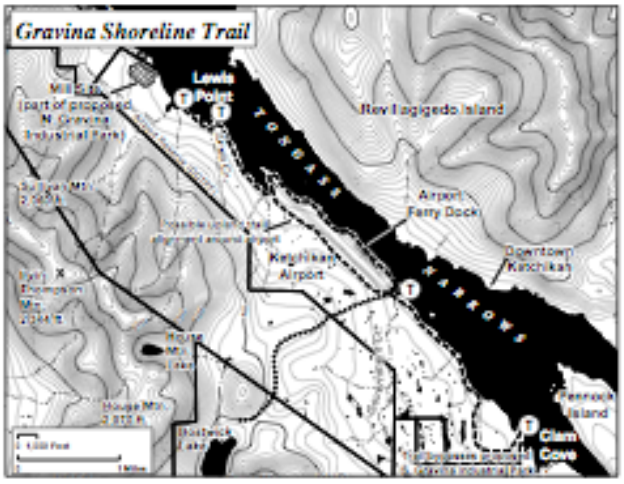

### 3.15 High Mountain Creek Beach

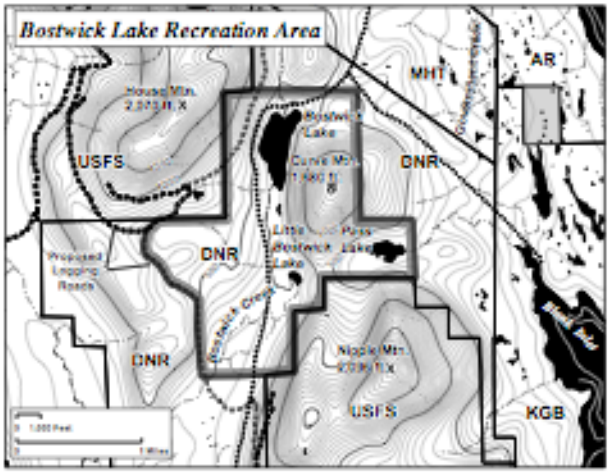
**Description:** Approx. 900 ft. of waterfront, including accessible beach and the High Mountain Creek estuary.
**Access:** Boat or floatplane (protected shoreline conditions but rocks and sandbars present); extension of N Gravina Road to area expected within 5 years; proposed trailhead for High Mtn Creek trail, link to Gravina trail network.
**Primary Uses:** Beachcombing, shoreline hiking, picnicking, hunting, camping, boating and kayaking.
**Community Interests/Values:** Excellent beach and shoreline area; most feasible shoreline access site to ensure real estate values for future upland lots (several miles of waterfront lots north and south are private).
**Protection Status:** Beach and shoreline area is part of 25.7 acre privately owned tract (KPC).
**Notes/Comments:** Gravina Plan re-zones this and adjacent Borough tract to Planned Development to retain public beach access while allowing residential/commercial devt.
**Applicable Policies:** RCA-1, 5, 6 and 7




### 3.16 Gravina Shoreline Trail

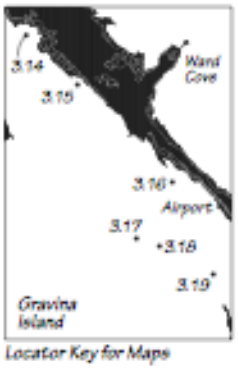
**Description:** Approx. 6 mi. (avg 50' width including buffer) of natural, relatively undisturbed shoreline along length of Airport Reserve.
**Access:** via Airport Ferry, boat or float-plane
**Primary Uses:** Hiking, hunting, kayaking, photography, sightseeing/visitor excursions (guided and self-guided).
**Community Interests/Values:** Opportunity to make natural shoreline accessible to residents/visitors; most of Gravina's Tongass Narrows shoreline is private and will be developed; attractive views from Ketchikan.
**Protection Status:** Shoreline within Airport Reserve, owned by State DOPTF, leased to Borough for airport operations (single ownership facilitates feasibility of trail).
**Notes/Comments:** Recreation use of shoreline is compatible with airport terminal functions and Airport Reserve industrial activities; proposed south runway extension may provide mitigation funding for trail.
**Applicable Policies:** RCA-1, 5, 6 and 7



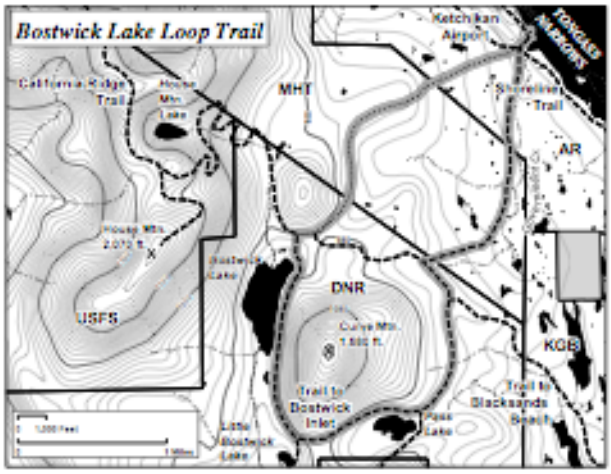




### 3.17 Bostwick Lake Recreation Area

**Description:** 1,750 acres of forested uplands, including Gravina's largest lake (73 acres) along with upper Bostwick Creek (Gravina's major salmon stream).
**Access:** Float-plane, hiking via 2 mile trail from Airport Ferry; existing harvest road close to Bostwick Lake.
**Primary Uses:** Hiking, camping, fishing, hunting, bird and wildlife viewing, winter sports
**Community Interests:** Potential to be Gravina's centerpiece recreation attraction; excellent fishing; situated in "pass" through mountains of California Ridge to interior; road provides RV access for camping, sightseeing.
**Protection Status:** State (DNR) owned land with multiple-use management; Borough's Gravina Plan recommends zoning area PLI for public recreation use.
**Notes/Comments:** Area is within DNR management unit K-41, which also includes mature commercial grade forest; planned timber harvest could impact recreation.
**Applicable Policies:** RCA-1, 6 and 7

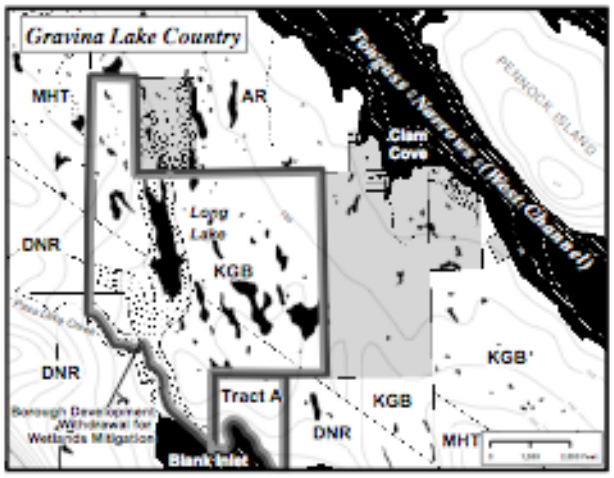


*Locator Key for Maps*




### 3.18 Bostwick Lake Loop Trail

**Description:** Approx. 8 mi. (avg. 100' width including buffer) of existing/proposed trail from south end of airport to Bostwick Lake, around Curve Mtn to Pass Lake, along Government Creek to airport.
**Access:** Airport Ferry and future Bostwick Lake Road.
**Primary Uses:** Hiking, x-country skiing, camping, hunting, wildlife observation and study.
**Community Interests/Values:** Provides access to one of Gravina's best recreation sites; part of trail network permitting access to shoreline as well as other attractions.
**Protection Status:** Trail crosses Mental Health Trust, DNR and DOTPF lands, no trail easement established.
**Notes/Comments:** Airport runway extension and road development will affect trailhead location; trails for ATV use possible on timber harvest roads and on proposed ATV trail up Vallenar valley.
**Applicable Policies:** RCA-1, 6 and 7



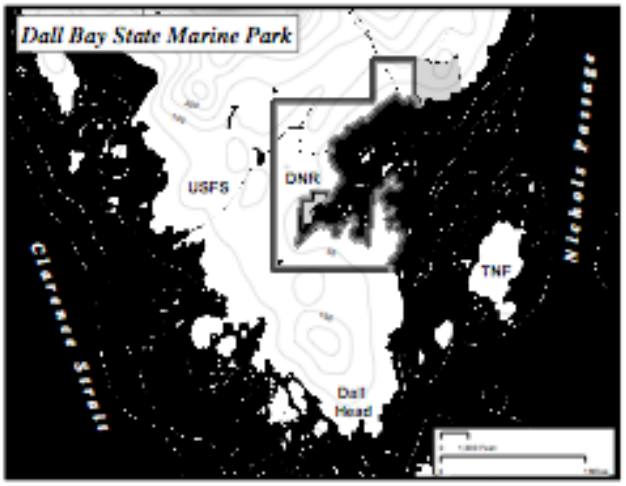

### 3.19 Gravina Lake Country

**Description:** Approx. 740 acres of wetlands/scrub forest west of Clam Cove, over 20 lakes (Long Lake is 0.75 mile long, 500 ft. wide) and catalogued salmon stream (coho).
**Access:** Trails/boardwalks to shorelines where boat access possible or future trailheads from road extensions to Clam Cove; area generally unsuitable for roads (ATV possible).
**Primary Uses:** Recreational cabin sites, fishing, hunting, wildlife viewing, hiking, scientific research
**Community Interests/Values:** Lakes part of salmon producing creek system; prime fish and wildlife habitat, supports migrating waterfowl; best example of lake-muskeg-estuarine complex of wetlands in the Borough.
**Protection Status:** Borough-owned except private Long Lake subdivision (84 acres); Gravina Plan designates it as "Gravina Lake Country Natural Area"; creeks/Long Lake shoreline dedicated open space for airport road mitigation.
**Notes/Comment:** Can be "wetland mitigation bank."
**Applicable Policies:** RCA-1, 6 and 7

*Areas Used for Recreation Continued*

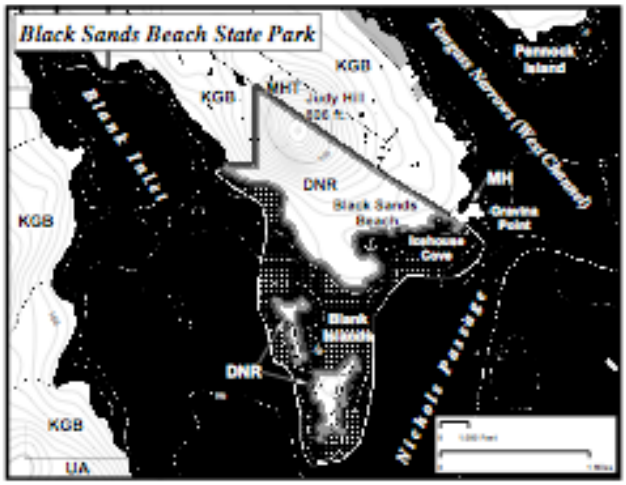
### 3.20 Dall Bay State Marine Park

**Description:** Approx. 850 acres (uplands) and 229 acres (tidelands) surrounding small bay near SE tip of Gravina
**Access:** Boat or float plane.
**Primary Uses:** Camping, boating and kayaking, fishing, hunting, hiking, subsistence gathering, prospecting.
**Community Interests/Values:** Diverse land and marine ecosystems in spectacular wilderness setting less than 20 miles from downtown; State Park status offers potential for mooring buoys and other public access improvements.
**Protection Status:** Tidelands designated State Marine Park (uplands in state selection status to be incorporated into park once land is conveyed); two private inholdings.
**Notes/Comments:** DNR management unit K-47 (uplands) and KT-31 (tidelands) with designated use categories of public recreation and facilities; USFS Gravina Island timber sale proposes logging (helicopter) on lower slopes surrounding park; old mining area, historic sites possible.
**Applicable Policies:** RCA-1, 5, 6 and 7



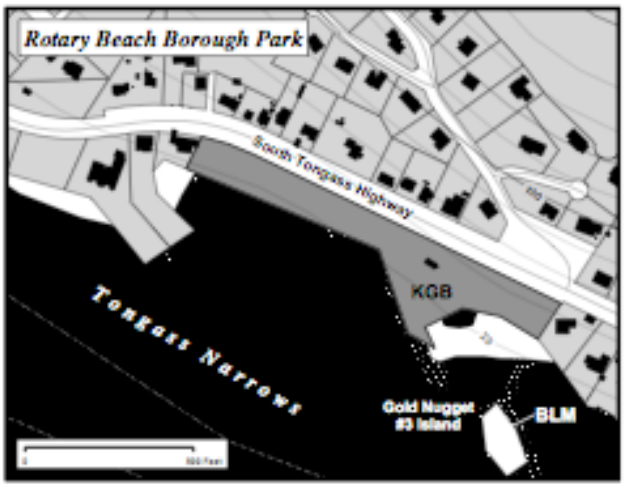

### 3.21 Black Sands Beach State Marine Park

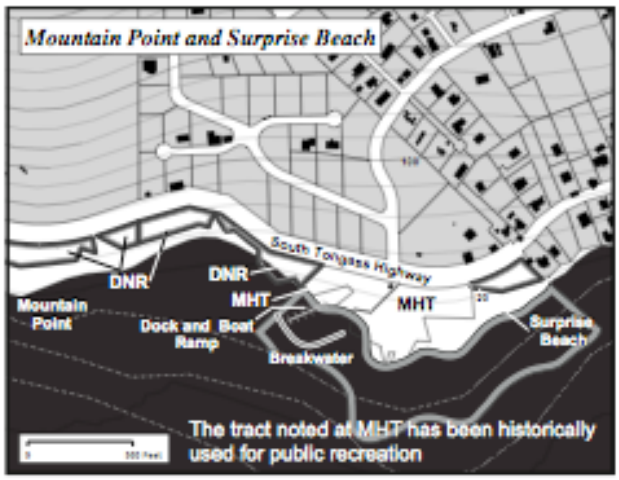
**Description:** Approx. 600 ft. of sandy beach, 3/4 mile of walkable shoreline; Blank Islands and marine waters
**Access:** Boat, kayak or float plane; potential for future road access if road extended from Clam Cove.
**Primary Uses:** Boating & kayaking, general recreation (especially during the summer), hiking, hunting, fishing.
**Community Interests/Values:** One of area's most popular beaches (15 mins from downtown by boat) with mooring buoy, basic sanitation (pit toilets); diversity of ecosystems; uplands with old growth spruce-hemlock forest.
**Protection Status:** All of DNR management unit K-45 (700 acres) is within or to be added to the Marine Park.
**Notes/Comments:** Commercial tourism potential on MHT and Borough lands east of site (near Ice House Cove); use would increase with dock, sanitation, trails, public awareness; destination on kayak trail; needs master plan.
**Applicable Policies:** RCA-1, 3, 5, 6 and 7

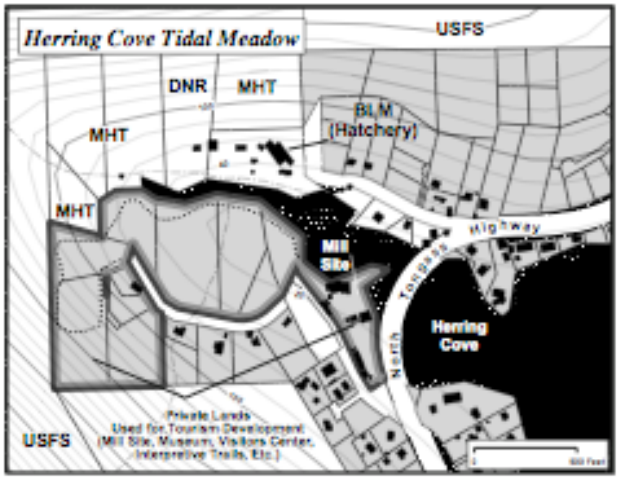


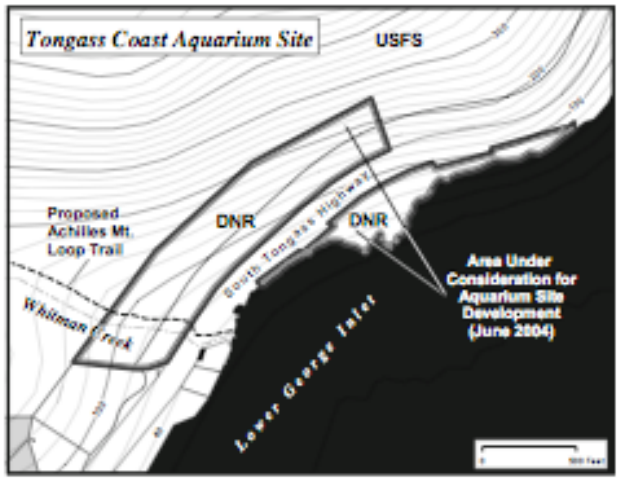

### 3.22 Rotary (Bugge) Beach Park

**Description:** Approx. 3.6 acres, 1/3 mile sandy and rocky shoreline; parking, restrooms, playground equipment.
**Access:** Road (about 3.5 miles S. Tongass Hwy), bike path, and Tongass Narrows (kayaks and small boats).
**Primary Uses:** Swimming, beachcombing, walking, SCUBA, kayaking, fishing, Beach Day (local schools).
**Community Interests/Values:** One of most accessible and used parks; one of few remaining natural shorelines along Revilla side of Tongass Narrows.
**Protection Status:** Designated Borough Park; small (1/3 acre) undeveloped island ("Gold Nugget #3") adjoining tidal lagoon is owned by Bureau of Land Management.
**Notes/Comments:** Existing trees maintain natural shoreline character and provide screening and separation from adjacent road and residences (need protection and more planted); Will soon be accessible via extended bike path.
**Applicable Policies:** RCA-1, 5, 6 and 7




### 3.23 Mountain Point & Surprise Beach

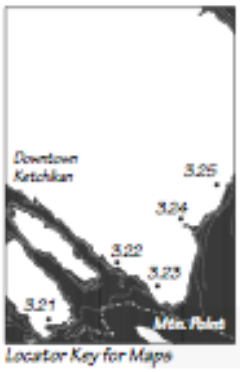
**Description:** Over 1/2 mile of mostly rocky shoreline (with a few small "pocket" beaches), and 8 acres of adjacent uplands, including the State boat launch.
**Access:** Road (mile 5.5 S Tongass Hwy); boat or kayak, exposed conditions, but breakwater at boat launch).
**Primary Uses:** Boating (popular launch site), shoreline fishing, sightseeing (road turnout/viewpoint), swimming, SCUBA, walking/jogging/bicycling (along road).
**Community Interests/Values:** Only public shoreline in Mtn Point area; maintains natural character of shoreline.
**Protection Status:** The actual "point" and Surprise Beach area are MHT land and could be sold; the State parcels are undevelopable shoreline tracts adjacent to highway ROW; the boat ramp and uplands are in DNR ownership.
**Notes/Comments:** Proposed site for a neighborhood park, key to this is the MHT tract adjacent to the boat launch. Will soon be accessible via extended bike path.
**Applicable Policies:** RCA-1, 5, 6 and 7

### 3.24 Herring Cove Tidal Meadow

**Description:** 9.7 acres of estuarine wetlands at the mouth of Eagle Creek in the community of Herring Cove.
**Access:** Road (S Tongass Hwy), trail and boardwalk.
**Primary Uses:** Walking/hiking, kayaking, fishing, bird and wildlife viewing, guided and self-guided tours.
**Community Interests/Values:** Opportunities for tourism; neighborhood views and open space; accessible public education site; variety of attractions (mill, fish hatchery, cove, wildlife viewing, salmon spawning).
**Protection Status:** Core wetlands/tidal meadow privately owned, hatchery lease on Federal and State lands.
**Notes/Comments:** Former mill site and upland tract used for tourism; parcels around salmon hatchery and MHT tracts zoned for industrial/commercial uses; heritage resources should be evaluated (registered petroglyph site # KET077); site for neighborhood park to be identified in this area; restrooms and parking needed for bridge.
**Applicable Policies:** RCA-1, 5, 6 and 7

### 3.25 Tongass Coast Aquarium Site

**Description:** 0.5 mi shoreline, 28.6 acres uplands in two tracts at mi 8.5 S.Tongass Hwy, on George Inlet
**Access:** Road (S Tongass Hwy); exposed, rocky shoreline makes boat access difficult without dock or float.
**Primary Uses:** Beachcombing, SCUBA, kayaking, fishing and hiking (walking, running, bicycling along highway). Site is for proposed 27,600 sf aquarium with exhibition space and facilities for research and regional education.
**Community Interests:** Would add to visitor attractions, support education programs, protect 1/2 mile of shoreline; trailhead for proposed Achilles Mtn loop.
**Protection Status:** Currently owned by DNR pending transfer to Borough and lease to Tongass Coast Aquarium.
**Notes/Comments:** Project depends on securing funds; site in DNR management unit K-39, with multiple use allowed (including timber harvest); trail easement along Whitman Lake to be reserved to USFS boundary.
**Applicable Policies:** RCA-1, 4, 5, 6 and 7



*Locator Key for Maps*

*Areas Used for Recreation Continued*

### 3.26 Vallenar Bay Shoreline & Open Space

**Description:** 49.4 acres (6,860 ft shoreline) in 5 shoreline tracts within recent State land sale; mostly rocky shoreline

**Access:** Boat only with no public mooring improvements; vehicle access possible via proposed USFS logging road.

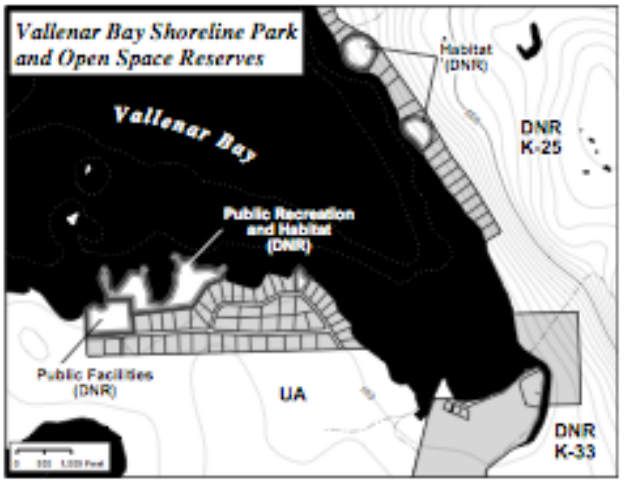
**Primary Uses:** Kayaking (good launch sites), fishing, hunting, recreational homesites, subsistence gathering.

**Community Interests/Values:** Gravina's 2nd largest creek/bay ecosystem, rich in fish/wildlife resources, with pristine water conditions; located in 1 of 3 "residential" areas proposed for Gravina; sites provide water access points for existing/future upland lots and general public.

**Protection Status:** Dedicated public access and/or habitat

**Notes/Comments:** Timber on adjacent University Trust lands may be harvested; DNR management unit K-25, (east side of Vallenar Bay) managed to protect habitat and viewsheds; estuary and extensive tideflats (DNR Unit KT-33) to be managed to protect high biological productivity.

**Applicable Policies:** RCA-1, 5, 6 and 7




### 3.27 Moser Bay Estuary

**Description:** 21 acres of estuarine wetlands and shorelines at the mouth of Moser Creek.

**Access:** Boat or floatplane only, generally protected waters; (potential road access if N Tongass Hwy extended from Lunch Creek (approximately 5.6 miles).

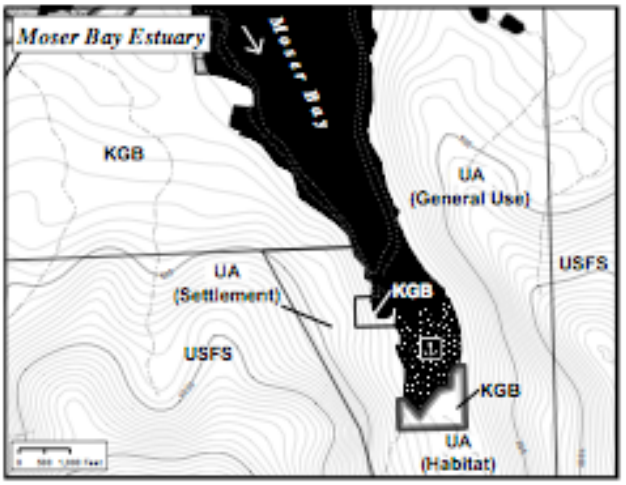
**Primary Uses:** Beachcombing, hiking, bird and wildlife viewing, kayaking and boating, personal resource harvest.

**Community Interests/Values:** Most significant estuary in Clover Pass area; adjacent areas with potential for tourism and homesite development.

**Protection Status:** Borough-owned parcel dedicated wetland reserve as mitigation for Gravina road development, other tracts currently open to development.

**Notes/Comments:** Adjacent DNR lands recently transferred to University Land Trust (map shows former DNR classifications); commercial timber on eastern side.

**Applicable Policies:** RCA-1, 2, 3, 5, 6 and 7




### 3.28 Salt Lagoon Estuary

**Description:** Approx. 880 acres of land surrounding the Salt Chuck (an extension of Upper George Inlet).

**Access:** Boat or float plane only

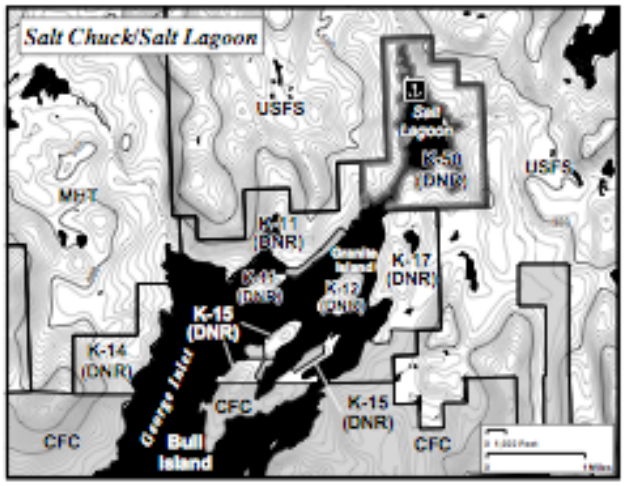
**Primary Uses:** Kayaking, SCUBA, wildlife viewing.

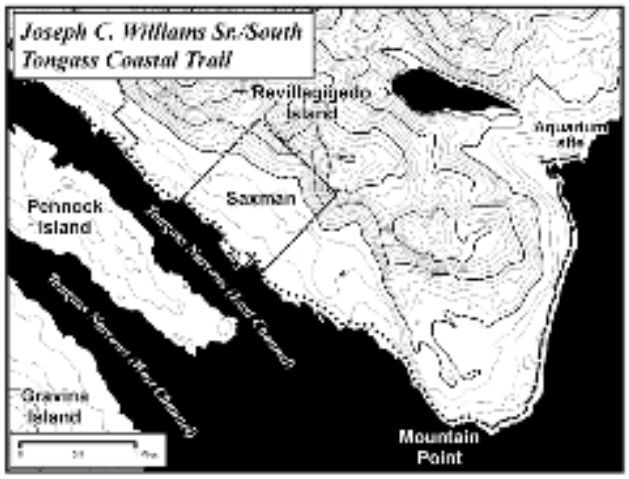
**Community Interests/Values:** Estuarine meadow, scenic area; wetlands, salmon stream; "regionally significant habitat functions (including wintering area for Trumpeter Swans and concentrations of Black and Brown bear along the five anadromous streams emptying into the lagoon

**Protection Status:** DNR policy calls for retention by State, recommended by ADF&G as "Critical Habitat."

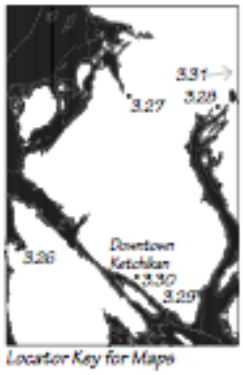
**Notes/Comments:** DNR designated "habitat"; powerline from Swan Lake crosses parcel as does proposed Shelter Cove Road (alignment not finalized); marine management unit KT-18 and adjacent areas include lands designated for settlement, with some lots subdivided and sold.

**Applicable Policies:** RCA-1, 3, 5, 6 and 7



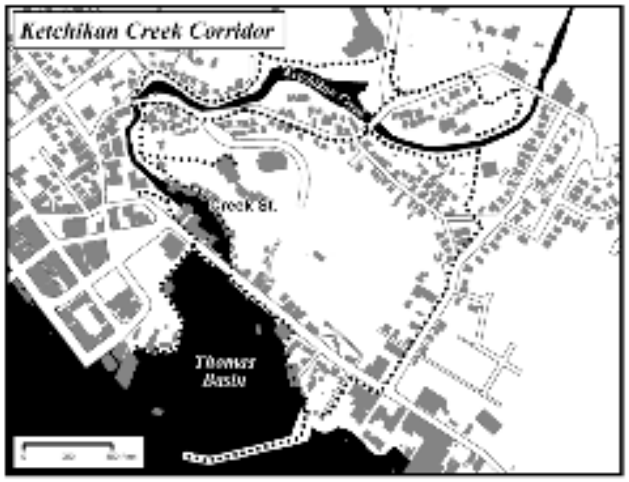




### 3.29 Joseph C. Williams Sr. /South Tongass Coastal Trail



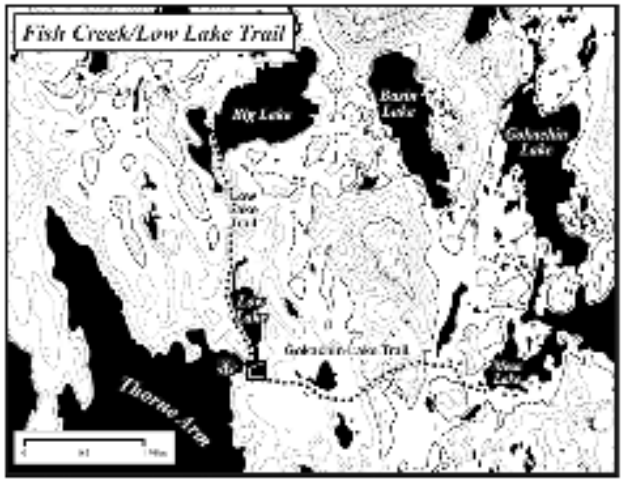
*Locator Key for Maps*

**Description:** Approx. 6 miles, (avg. 8' width) of existing paved bike/walking path from Ketchikan to Mountain point, with aproposed 3 mile extension to Tongass Coast Aquarium.
**Access:** South Tongass Highway (land), Tongass Narrows/George Inlet (water, somewhat rocky with occasionalbeach access).
**Primary Uses:** Walking, jogging, bicycling, picnicking. Community Interests/Values: Access to natural shoreline for residents/visitors.
**Protection Status:** Most of trail is within State ROW.
**Notes/Comments:** Shoreline trail is popular destination for local bikers/walkers. Extension from Saxman to Mountain Point to be complete in 2006. An extension to the aquarium is proposed. Federal lands are excluded from designation.
**Applicable Policies:** RCA-1, 5, 6 and 7




### 3.30 Ketchikan Creek Corridor

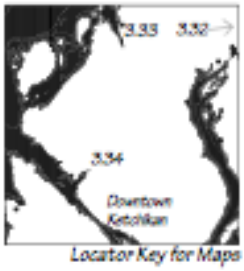
**Description:** The trail system begins at creek mouth and extends along Creek St, Married Man's Path, Harris St and Park Avenue (along both creekbanks), Schoenbar Trail and finally to fish hatchery, Totem Heritage Center and City Park.
**Access:** The trail system is accessed from many points.
**Primary Uses:** Hiking, cultural heritage, salmon viewing, jogging and picnicking.
**Community Interest/Values:** Ketchikan's most popular and historically significant creek and trail system, a premier visitor attraction, habitat for a variety of fish and wildlife, "urban wilderness" trails used by all ages.
**Protection Status:** Only portions of the trail system are protected; most of the corridor has been vulnerable to derelict structures, vegetation removal, materials storage, etc.
**Notes/Comments:** Trails plan and protection measures are needed for entire corridor with elements such as lighting, viewing platforms, interpretive signage and safety features.
**Applicable Policies:** RCA-1, 5, 6 and 7




### 3.31 Fish Creek/Low Lake Trail

**Description:** Recreation area 26 miles NE of Ketchikan with a USFS cabin where Fish Creek meets Thorne Arm. Two maintained hiking trails: Low Lake (to Big Lake in Misty Fjords) and Gokachin Lake (to Star Lake) Trails.
**Access:** Boat or float plane, two mooring buoys available (one at Sea Level Mine).
**Primary Uses:** Camping, hiking, fishing (salmon, trout, steelhead), hunting, trapping, canoeing, kayaking.
**Community Interest/Values:** Popular fishing and boating recreation area, with prime salmon and trout streams, accessible lakes and hiking trails, extensive deer & waterfowl habitat.
**Protection Status:** No official USFS protective designation; the area lies between the Misty Fjords National Monument boundary and a resource extraction area.
**Notes/Comments:** Protection status to be sought for important fresh water fishery. Nearby timber harvests could impact.
**Applicable Policies:** RCA-1, 3, 5, 6 and 7

## *Areas Used for Recreation Continued*




*Locator Key for Maps*


### 3.32 Wolf Creek and Wolf Lakes

**Description:** Marine estuary and trailhead to Lower and Upper Wolf Lakes, with trail access to Leask Lakes, Naha River National Recreation Area, and Lake Harriet Hunt (approximately 2.75 miles & 200' width including buffer).

**Access:** Boat and float plane (via Moser Bay), trail connections from other areas.

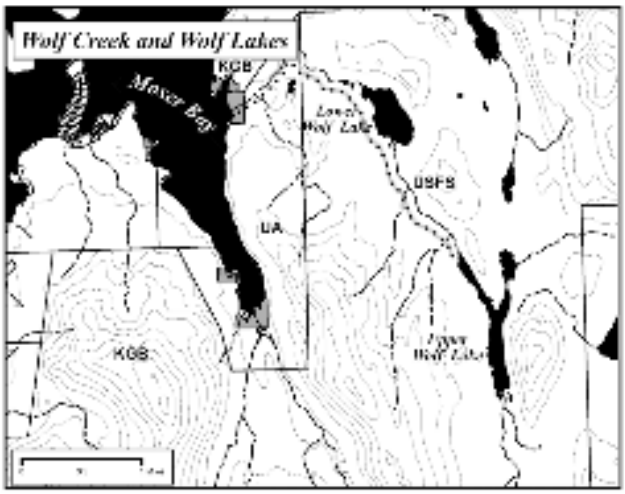
**Primary Uses:** Hiking, fishing, camping, hunting.

**Community Interests/Values:** Important remote hiking area with links to nationally significant trails and destinations.

**Protection Status:** USFS Recreation designation for area on USFS land; no protection for corridor on University land nor on private land at the mouth of Wolf Creek.

**Notes/Comments:** Trail is not regularly maintained, portions of it lie on private and University land and permanent easements are needed across those lands. Federal lands are excluded from designation.

**Applicable Policies:** RCA-1, 5, 6 and 7




### 3.33 Naha Bay

**Description:** Gateway to Naha River National Recreation Area, includes private and USFS lands and shoreline and the State float at the boaters' entrance to the recreation area.

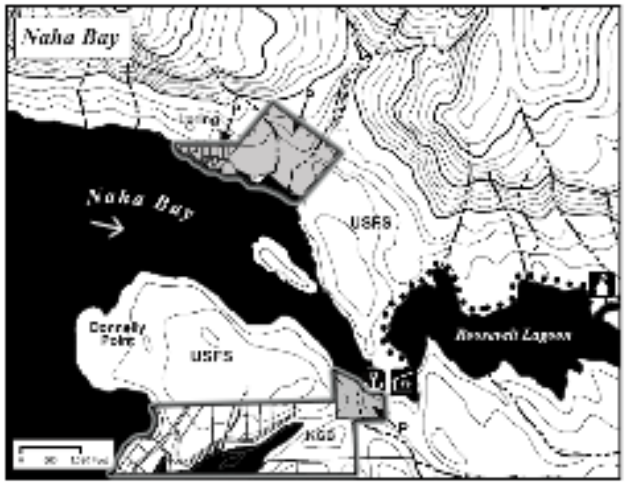
**Access:** Boat or float plane or from trail connections. Primary Uses: Yachting, hiking, fishing (salmon, trout, steelhead), kayaking, lodges, residential uses (esp., Loring).

**Community Interest/Values:** Popular local and worldclass visitor destination for fresh water fishing, also includes productive marine estuary and shellfish, crab, and shrimp collection, and outstanding natural scenery.

**Protection Status:** Private lands have very few land use controls, USFS lands are not part of designated recreation area although Donnelly Point and the area east of the cannery site at Loring have viewshed protection measures.

**Notes/Comments:** Private lands near State float and Loring should minimize site disturbance to protect quality of entry to recreation area. A shoreline trail is proposed between Naha entry float and Loring. Federal lands are excluded from designation.

**Applicable Policies:** RCA-1, 2, 3, 5, 6 and 7




**Non-Enforceable Resource Maps**

### 3.34 Ward Creek/Ward Lake Recreation Area

**Description:** Contains multiple hiking trails along Ward Creek from Ward Cove to Last Chance campground, around Ward Lake, and to Perseverance and Connell Lakes, as well as 3 seasonal campgrounds, and picnic shelters on Ward Lake.

**Access:** From North Tongass Highway at Ward Cove, or from Revillagigedo Road/ Ward Lake Road

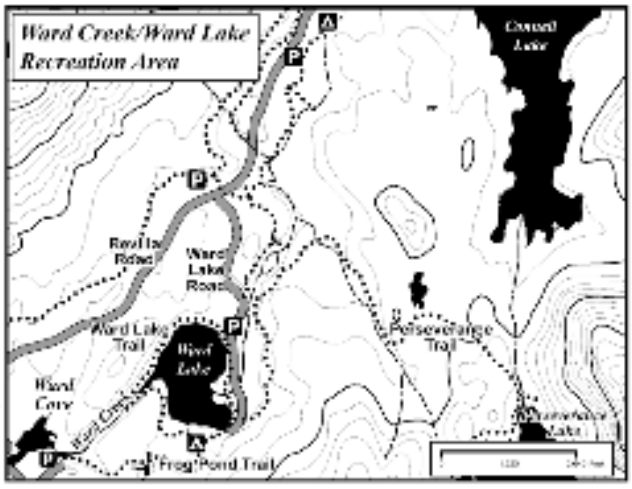
**Primary Uses:** Camping, hiking, biking, fishing (salmon, trout, steelhead), canoeing, and day-use picnic facilities.

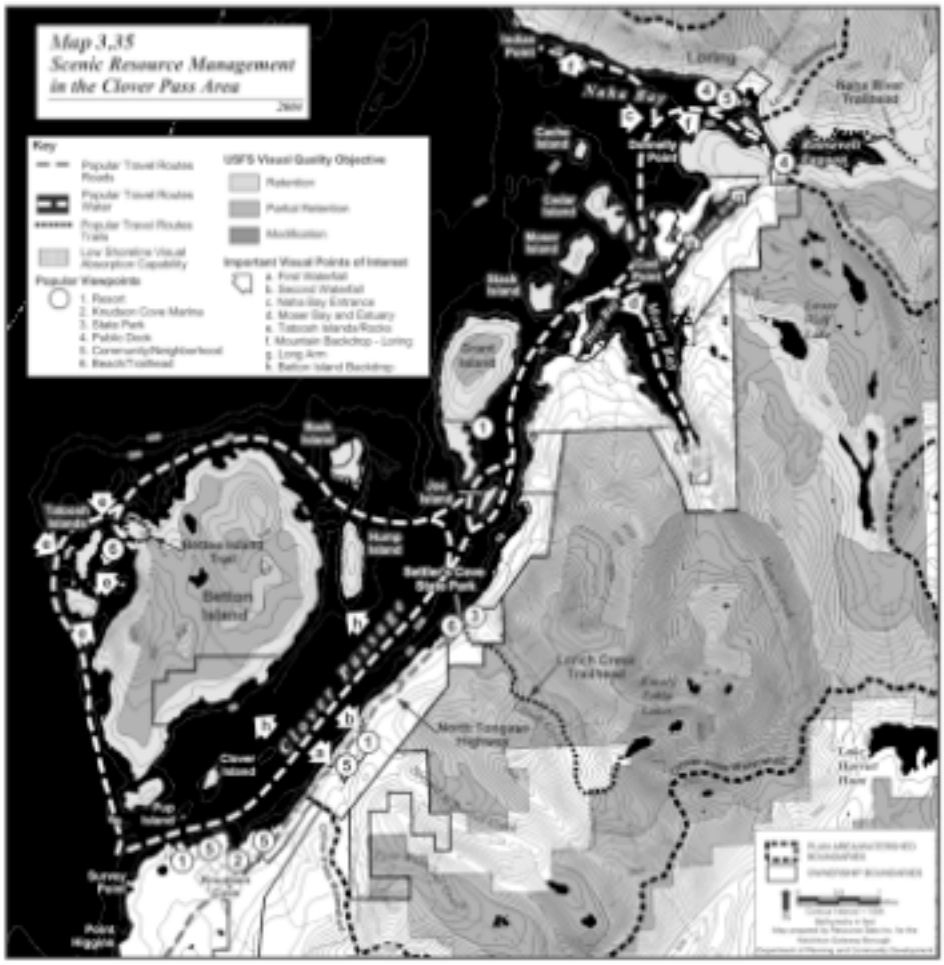
**Community Interest/Values:** Ketchikan's most popular rural recreation destination, especially the loop trail around Ward Lake and nearby picnic areas. Ward Creek is the only road accessible stream for fresh water steelhead and trout fishing and is heavily used by fishermen.

**Protection Status:** USFS-designated recreation area.

**Notes/Comments:** Needs public parking lot at Frog Pond trailhead in Ward Cove, and improved fishing access to intertidal area in Ward Cove. Federal lands are excluded from designation.

**Applicable Policies:** No enforceable policies






## Areas Used for Recreation Continued
## Non-Enforceable Resource Maps

*Map Figure 3.35 Scenic Resource Management in the Clover Pass Area*
*The "Clover Pass Scenic Area" was first introduced as a policy in the Borough's 1976 Comprehensive Plan in recognition of the area's significant recreational and scenic assets. People experience Clover Pass scenery by boat, by vehicle (as far as Settler's Cove), and from viewpoints such as resorts and residences. The Clover Pass viewshed is essentially from ridgetop to shoreline and, since most people experience the area from the water, the shoreline and nearer uplands are visually the most critical. The Clover Pass Scenic Area Plan (a companion document to this coastal plan) documents the area's scenic resources and provides a summary of US Forest Service's visual analyses of this area (see above). The scenic resources along Tongass Narrows and other locations of the Coastal District are also being evaluated.*

## Energy Facilities

**Issues of Local Concern:** The limited supply and high cost of electrical power is seen as an impediment to growth and economic development.

**Goal 1: Reduce the cost of power. (See Policy EF-1)**
**Objective 1.A:** Complete the Swan Lake Inter-tie. (See Policy EF-1(C))

**Goal 2: Increase power capacity, reliability and predictability. (See Policy EF-1)**
**Objective 2.A:**
Complete hydroelectric projects that increase the supply of electricity and reduce retail rates. (See Policy EF-1(A))

**Objective 2.B:**
Explore other sources of electrical power generation. (See Policy EF-1)

**Statewide Standards**
*11 AAC 114.250. Subject uses, activities, and designations***.** (e) A district shall consider and may designate, in cooperation with the

## Energy Facilities Enforceable Policies

### EF-1: Designated Energy Improvements

The following sites suitable for development of major energy facilities are shown on Map Figure 4.1 titled: Areas Designated for the development of major energy facilities. Preservation of transmission corridors, power generation site uses, and related activities shall be considered the primary uses in the following areas. These areas shall be managed and developed with the recognition that power generation uses will be maintained and expanded.

A. Hydroelectric facilities at Swan Lake, Beaver Falls, Silvis Lake, the Ketchikan Power House, Upper Mahoney Lake and Upper Mahoney Creek near Ketchikan.
B. Diesel power generation at the Bailey Diesel Plant.
C. The Swan Lake-Lake Tyee Intertie consisting of a transmission line from Ketchikan to the Petersburg/Wrangell area including the proposed right-of-way.
D. A new transmission line to Annette and Gravina Islands.
E. Connell Lake Dam, pipeline, and generating facilities at Ward Cove.

# Resource Inventory and Analysis

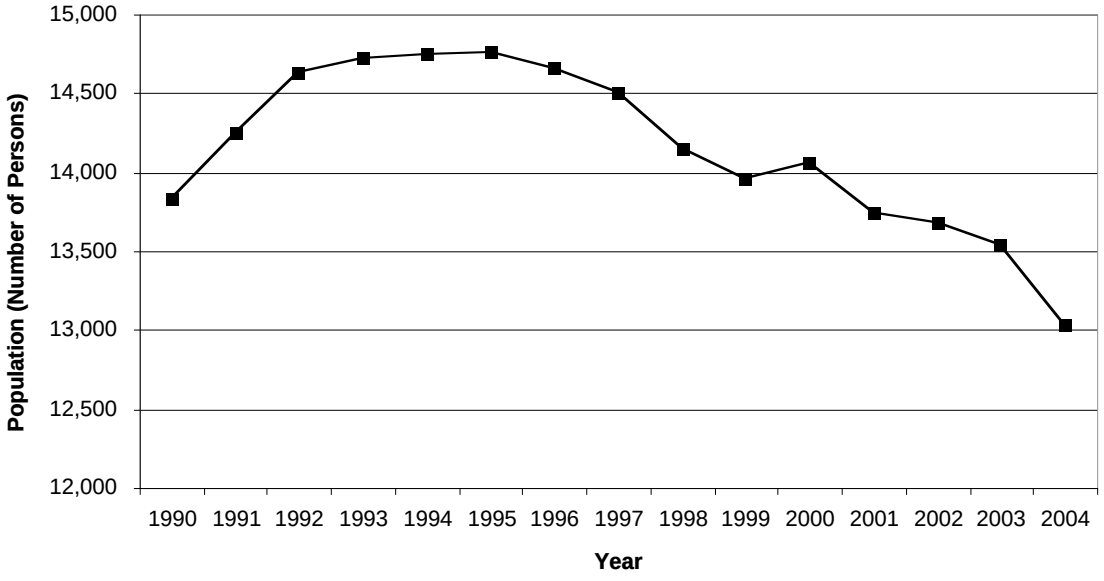
Activities on those federal lands located within the district's coastal boundaries are subject to the consistency provisions of Section 307 of the Coastal Zone Management Act of 1972 as amended.

# Coastal Development

## Population Trends

In recent years, many changes have affected the population of the Ketchikan area, including closure of the pulp mill, decline of the timber industry, growth of the Ketchikan Shipyard, and the rise of the tourism industry. According to the Alaska Department of Labor and Workforce Development (DOLWD), the population of the Ketchikan Gateway Borough, including the cities of Ketchikan and Saxman and outlying communities, decreased by 5.7% from 1990 to 2004 (DOLWD, 2005). However, these percentages do not portray the range of changes that occurred during the intervening years. *Graph Figure 2.2* illustrates that the population increased annually from 1990, reaching a peak of 14,764 in 1995. Although a slight rebounding occurred in 2000 and 2001, the population continued declining.

*Figure 2.2. Ketchikan Gateway Borough Population, 1990-2004*

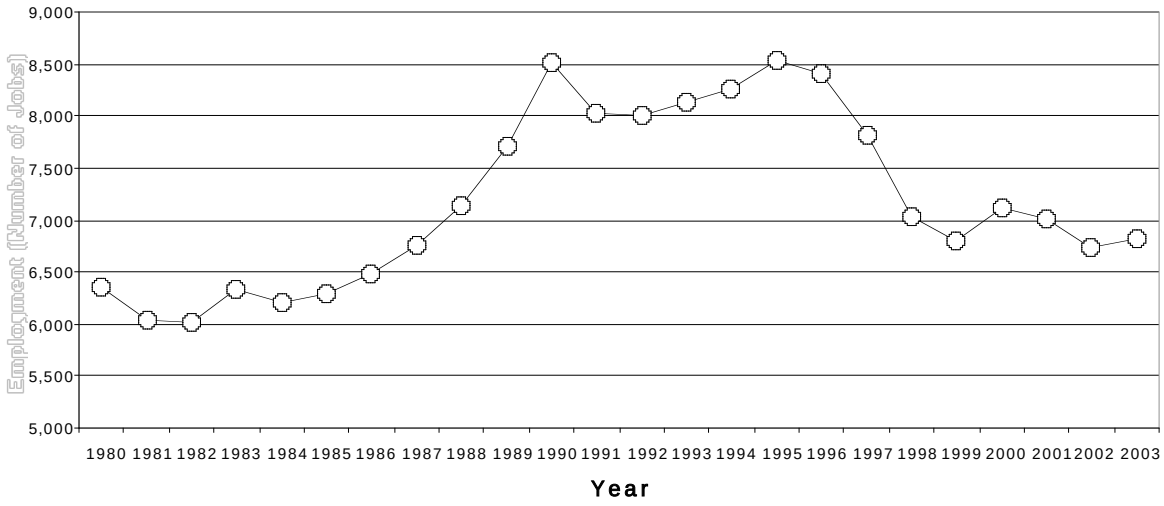



Source: DOLWD, 2005.

## Employment Trends

The total number of jobs in the Ketchikan Gateway Borough increased steadily from 1980 until 1995, and then decreased after 1995, as shown in *Graph Figure 2.3*. In 1980, the total number of jobs in the Borough was 5,842, compared to 6,816 in 2003—an increase of 14.2% for the 20-year period. Because employment increased by 36.6% from 1980 to 1995, it is clear that the drastic reductions in employment after 1995 had a significant effect on the overall growth of employment during the entire period. Declines in employment have not kept place with declines in population however. This disproportionate change is likely due to an increase in seasonal visitor industry employment during the second and third quarters.

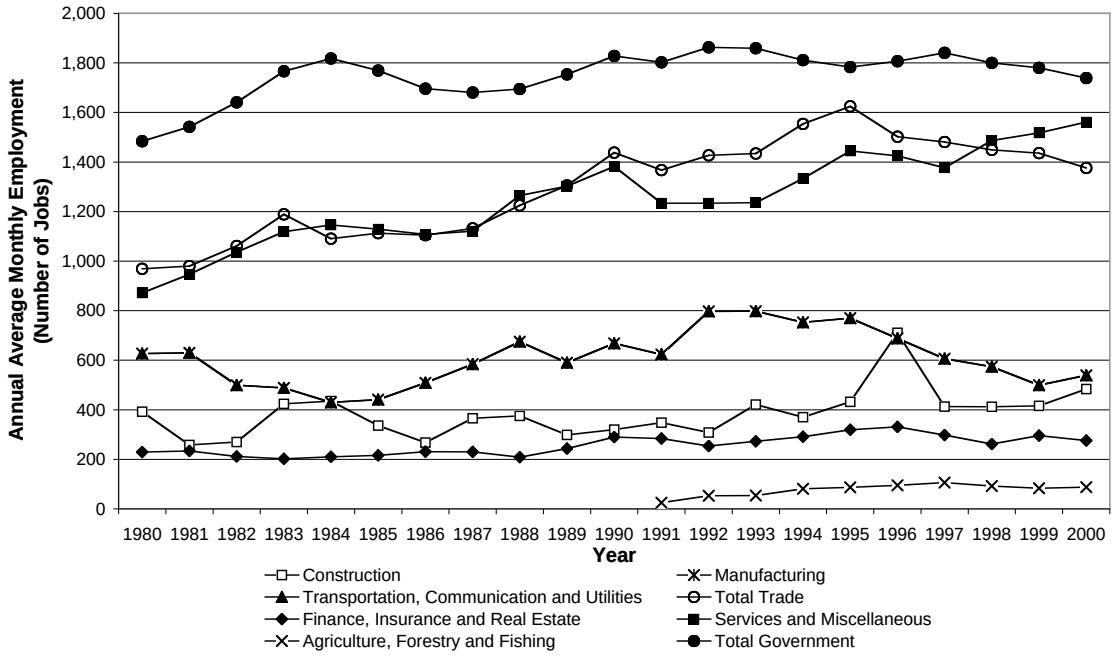
*Graph Figure 2.3. Annual Average Ketchikan Gateway Borough Employment, 1980-2003*




Source: DOLWD, 2005.

Employment by industry from 1980 through 2000 is illustrated in *Graph Figure 2.4*. which shows a total employment increase of 21.8% over the time period. In 2000, the government sector employed the largest percentage of workers in the borough, accounting for 24.4% of total employment. The industry sector with the smallest percentage of employment was agriculture, forestry, and fishing, accounting for only 1.2% of total employment. The closing of the pulp mill in 1997 is reflected in the decrease in manufacturing jobs in the late 1990s, and the rise of the tourism industry is reflected in the increasing number of jobs in the services industry sector.

*Graph Figure 2.4. Ketchikan Gateway Borough Employment by Industry, 1980-2000*




Source: DOLWD, 2002.

Note: Data were not available for the mining industry because of nondisclosure requirements for the entire period and were not available until 1991 for the agriculture, forestry, and fishing industry sector.

Agriculture, forestry, and fishing employment include those people who receive a wage for fish or timber harvesting and other support industries. Self-employed individuals are not included. Seafood processors and logging camp employment are included in manufacturing employment.

## Population and Employment Forecasts

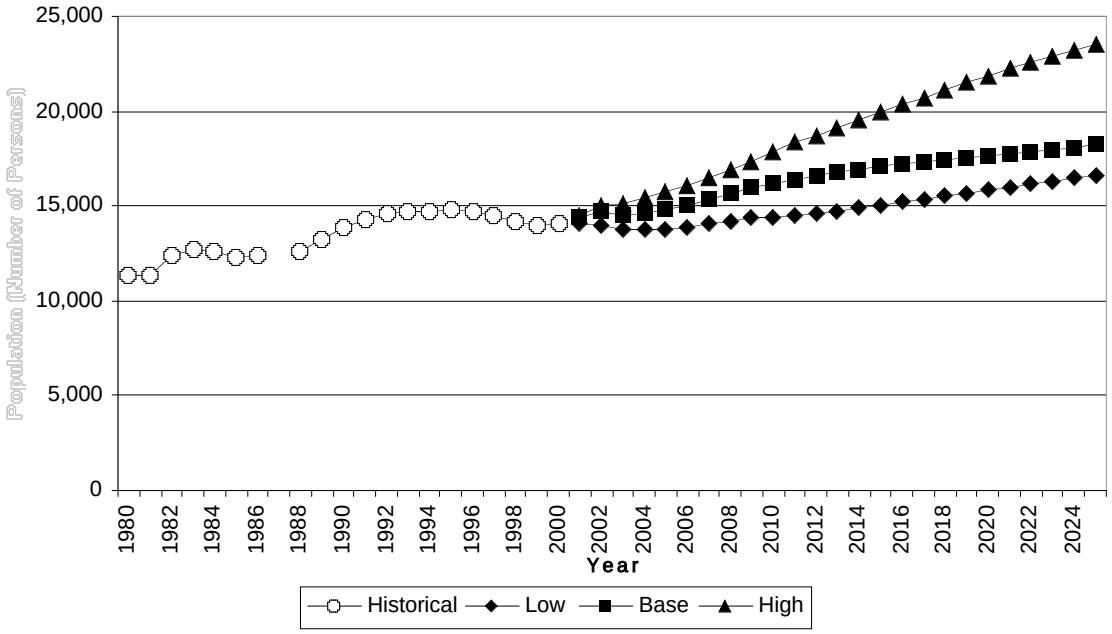
Based on historical data low-, base-, and high-case scenarios for economic growth of the Ketchikan Gateway Borough were analyzed as part of the Gravina Access Project (DOT&PF, 2001) and shown on *Graph Figure 2.5*. This subsection depicts actual and projected population and employment levels in the Ketchikan Gateway Borough through 2025.

**Low Case.** The low case results in a population of 16,624 in the Ketchikan Gateway Borough in 2025. This number reflects a compound annual growth rate of approximately 0.67% from a 2000 population of 14,070, and is slightly higher than the growth rate that occurred between 1960 and 1995 (0.63%). The low case results in a total employment of 7,379 in 2025.

**Base Case.** The base case results in a population of 18,225 people in the Ketchikan Gateway Borough in 2025. This figure represents a compound annual growth rate of 1.04% from a 2000 population of 14,070 and is slightly higher than the growth rate that occurred between 1950 and 1995 (1.0%). The base-case scenario results in a total employment of 8,377 in 2025.

**High Case.** The high case results in a population of 23,478 in the Ketchikan Gateway Borough in 2025. This figure represents a compound annual growth rate of 2.07% from a 2000 population of 14,070, and is slightly higher than the annual growth rate of 2.03% that occurred between 1980 and 1990. The high-case scenario results in a total employment level of 11,091 in 2025.

*Graph Figure 2.5. Actual and Projected Population in the Ketchikan Gateway Borough, 1980-2025*



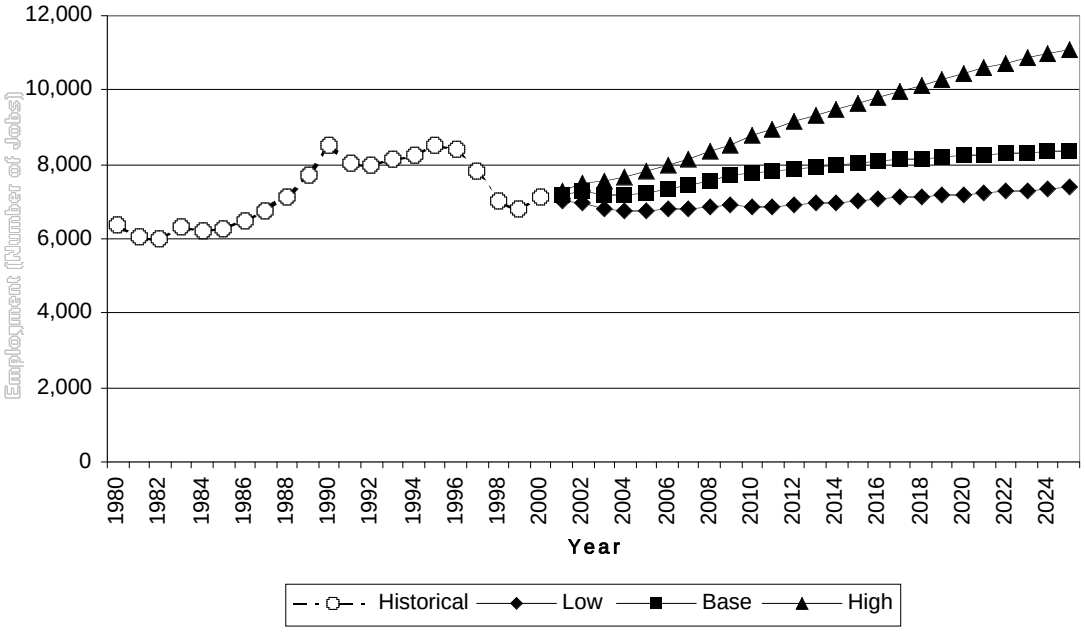

Source of historical data: DOLWD, 2000.
Note: DOLWD did not make community-wide population estimates in 1987.

**Table Figure 2.6 Actual and Projected Population in the Ketchikan Gateway Borough, 2000-2025**

| Year | Actual and Projected Population (Number of Persons) | | |
|---|---|---|---|
| | Low Case | Base Case | High Case |
| 2000 (actual) | | 14,070 | |
| 2005 | 13,806 | 14,787 | 15,741 |
| 2010 | 14,380 | 16,206 | 17,877 |
| 2015 | 15,063 | 17,092 | 19,933 |
| 2020 | 15,827 | 17,679 | 21,871 |
| 2025 | 16,624 | 18,225 | 23,478 |

Source: Northern Economics projections based on DOLWD historical data.

*Graph Figure 2.7. Actual and Projected Employment in the Ketchikan Gateway Borough, 1980-2025*




Source of historical data: DOLWD, 2000.

**Table Figure 2.8 Actual and Projected Employment in the Ketchikan Gateway Borough, 2000-2025**

| Year | Actual and Projected Employment (Number of Jobs) | | |
|---|---|---|---|
| | Low Case | Base Case | High Case |
| 2000 (actual) | | 7,118 | |
| 2005 | 6,771 | 7,252 | 7,816 |
| 2010 | 6,879 | 7,752 | 8,767 |
| 2015 | 7,028 | 8,055 | 9,654 |
| 2020 | 7,202 | 8,228 | 10,461 |
| 2025 | 7,379 | 8,377 | 11,091 |

Source: Northern Economics projections based on DOLWD historical data.

## Climate

The Ketchikan Gateway Borough lies in the maritime climate zone, which is noted for its mild winters, cool summers, and heavy precipitation as shown on *Table Figure 2.9*. Average summer temperatures range from 40° to 65° Fahrenheit (F). Maximum summer temperatures rarely exceed 70° F and usually occur in August. Average winter temperatures range from 28° to 48° F, with the coldest days occurring in January. Because of the warming influence of the Pacific Ocean, it is uncommon for the temperature to stay below freezing all day (Ketchikan Gateway Borough Planning Department, 1977). Significant days of cloud cover and extreme precipitation characterize the area. Average yearly precipitation is approximately 150 inches. The wettest and the driest months of the year are usually October and July, respectively. The area receives approximately 37 inches of snow annually. Snow fall, however, usually quickly melts or alternates between snow and rain at sea level.

**Table Figure 2.9. Monthly Climate Summary Ketchikan, Alaska**
**Period of Record: 9/1/1949 to 8/31/1999**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Avg. Max Temp (F)** | 38.8 | 42.2 | 44.5 | 50.4 | 56.7 | 61.6 | 65.3 | 65.4 | 60.5 | 52.1 | 44.9 | 40.8 | 51.9 |
| **Avg. Min Temp (F)** | 27.9 | 31.4 | 32.5 | 36.3 | 41.5 | 47.1 | 51 | 51.6 | 47.3 | 40.9 | 34.6 | 31 | 39.4 |
| **Avg. Total Precip. (in.)** | 12.8 | 13.1 | 10.4 | 11.2 | 9.2 | 7.38 | 7.12 | 10.6 | 13.6 | 22.4 | 16.7 | 15.5 | 149.9 |
| **Avg. Total Snow Fall (in.)** | 13.3 | 8.9 | 3.4 | 0.3 | 0.1 | 0 | 0 | 0 | 0 | 0.1 | 2.3 | 8.6 | 36.9 |
| **Avg. Snow Depth (in.)** | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| **Wind Speed* (mph)** | 12 | 12.3 | 11 | 11.2 | 9.3 | 9 | 8 | 8.3 | 9.3 | 12 | 12.4 | 12.6 | 10.6 |

* recorded at Annette, Alaska from 1962-1993.
Source: Western Region Climate Center Alaska Climate Summaries for Ketchikan, Alaska (http://www.wrcc.sage.dri.edu/summary/climsmak.html)

Prevailing winds in the Ketchikan area are from the southeast, with strong southeasterly winds from October through March. Approximately one-third of the days, annually, are calm (Ketchikan Gateway Borough Planning Department, 1994). Local climatic patterns are strongly influenced by the mountainous topography of the region, especially the physical features of Tongass Narrows, which tend to channel the wind. Thick fogs are infrequent and of short duration in the area (Western Regional Climate Center, 2000).

## Topography

Forested, steep, mountain slopes form the coastline of Revillagigedo Island, with peaks rising over 3,000 feet on the eastern side of the island. Gravina Island's steep mountain slopes rise over 2,000 feet. Wet slopes and valley floors separate the mountains from sea level.

## Shoreline and Bathymetry

Shorelines in the developing areas of Ketchikan Coastal District are characterized by steep bedrock or coarse gravel, cobble, and boulders; strong tidal currents; and unusually large tidal ranges (25 feet or more). Many of the lower intertidal and shallow subtidal areas are sandy or mixed gravel, sand, and shell, with varied amounts of silt. Protected deepwater coves and gently sloping sandy beaches are relatively scarce and are often the location of residential or other development.

The subtidal margins are characterized by steeply sloping bedrock or coarse gravel/cobble bottoms extending from the lower intertidal zone to the deeper, flatter center of the fjords at depths of 300 to 600 feet mean lower low water (MLLW). For the most part, these subtidal slopes are swept by strong tidal currents and support a number of kelp and other algal species down to depths of about –40 feet MLLW. In spring and summer, many of these rocky areas support a canopy of bull kelp. At depths below –40 feet MLLW, the bottom becomes nearly barren sand and gravel.

The shoreline provides accessory or primary access to much of the developing area of the coastal district which underscores the need to manage the placement of structures to avoid impacts to navigation and preserve access to surrounding property. Tidelands and submerged lands are under a mix of DNR and Ketchikan Gateway Borough ownership. It is expected that the demand for tideland leases will continue to increase as in-fill development within the expected area continues during the planning period.

## Geology

Glacial ice and erosion shaped the landforms in the Ketchikan area. Evidence is visible everywhere in the rounded slopes, U-shaped valleys, exposed smooth bedrock, fiords, and glacial mountain lakes. Ketchikan sits atop the Pacific Plate, which is sliding northward by the North American Plate along the Queen Charlotte Islands-Fairweather-Chatham Strait Fault system. Such physical features as Tongass Narrows, Vallenar-Bostwick Valley, and Carroll Inlet are examples of features formed by tectonic activity.

Bedrock in the Ketchikan region is composed of phyllites, schists, and several varieties of igneous rocks. Schist is a coarse-grained, strongly foliated rock and phyllite is less coarse. The igneous rocks tend to be hard and weather resistant. As a result of actions during glacial times, unconsolidated deposits such as marine deposits, beach and stream deposits (including alluvial fan and fan-delta deposits, muskeg, and colluvium deposits) overlay the bedrock.

A network of faults crisscrosses southeastern Alaska. The Queen Charlotte-Fairweather fault, which is known to be active, represents the boundary between the North American and Pacific plates. This fault line is oriented northwest-southeast and is approximately 100 to 110 miles southwest of Ketchikan. The Chatham Strait fault line is east of the Queen Charlotte-Fairweather fault and oriented in a north-northwest to south-southeast direction. It intersects the Queen Charlotte Fairweather fault southwest of Ketchikan. The Chatham Strait fault offset rocks as much as 95 miles when it was active 2 to 65 million years ago. The Clarence Strait fault is in Clarence Strait, which is just west of Gravina Island, and has approximately 9 miles of displacement.

The marine deposits consist of poorly graded, fine-grained sand with some gravel and silt. Fan-delta deposits consist of sand, gravel, and boulders and become finer grained to seaward. The deposits are present at the mouths of Ketchikan, Carlanna, and Hoadley Creeks and other smaller streams that flow into the Tongass Narrows. These deposits also are associated with streams on Gravina Island that flow into the Tongass Narrows. The fan-delta deposits generally have a loose to medium density and are saturated.

## Soils

Glaciation formed the soils and topography of the Ketchikan area thousands of years ago. With little seasonal variation, the heavy precipitation and cool temperatures of the area make climate the most influential factor on soil characteristics in the area. The region's soils are incessantly wet. The cool, wet climate of the region results in slow rates of decomposition of organic matter and highly acidic soils that are low in available nutrients. Glacial till or bedrock is normally found beneath the soil in Ketchikan, and is often responsible for the poorly drained soils on gentle slopes.

The region's soils are generally forested soils or muskegs high in organic matter. Forested soils occur in a range of geomorphological conditions, from lowlands to rocky side slopes to steep slopes. These soils are moderately well drained with some well and poorly drained soils in certain areas. The depth to bedrock in both forested soils and muskeg ranges from 0 to 15 feet or more. Muskegs are commonly found on level or gently sloping landforms and have poor drainage. Gravina Island soils are mainly muskeg and poorly drained-forested soils. The eastern portion of Gravina Island is primarily muskeg.

## Vegetation

The ample precipitation that the district receives influences the vegetation and natural communities that occur there. Over 900 species of vascular plants comprise a variety of habitats that occur within the Ketchikan Gateway Borough, including temperate rain forests, alpine tundra, streams, rivers, lakes, and ponds, freshwater wetlands, salt marshes, and rocky intertidal areas. Vegetated communities provide feeding, breeding, and resting areas for many animal species important to humans.

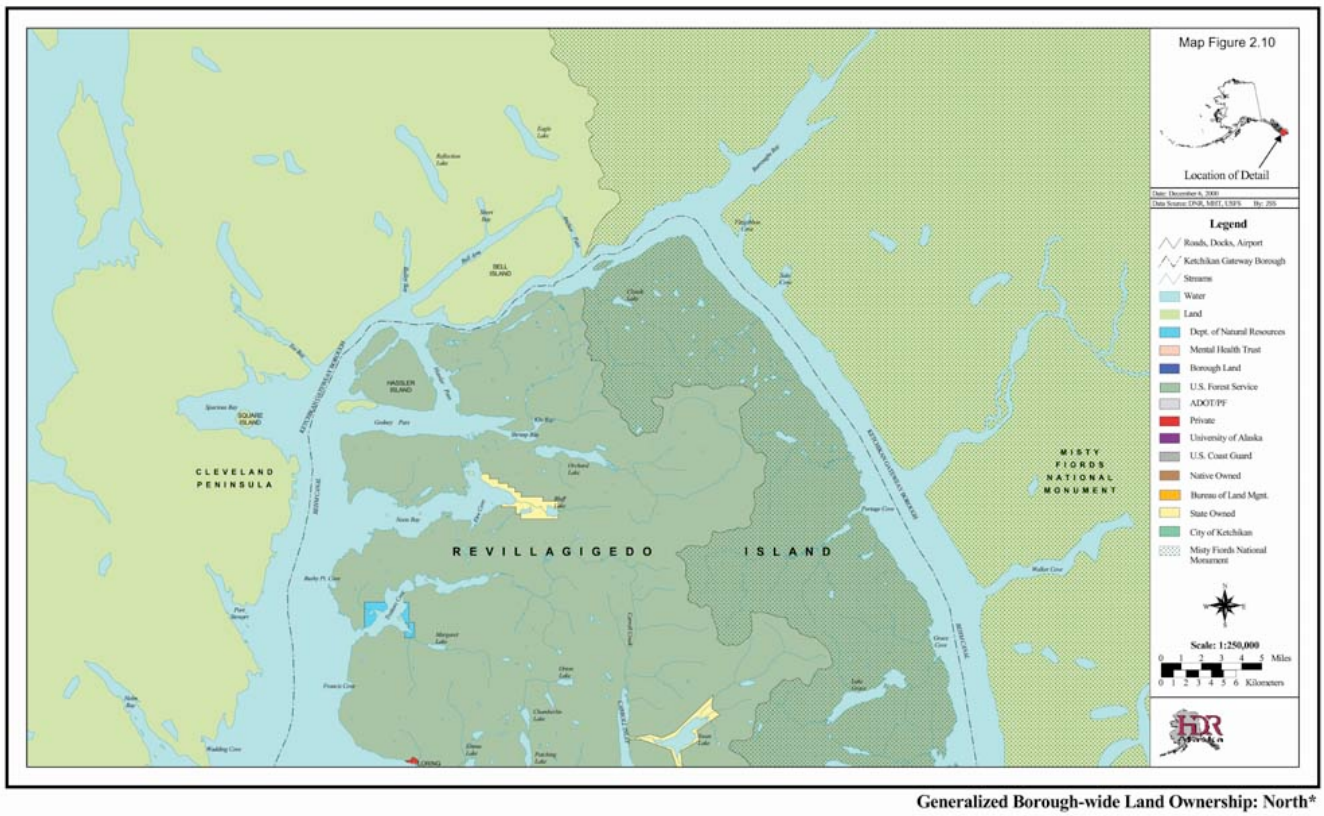
The Tongass National Forest comprises about 77 percent of southeastern Alaska. At 17 million acres, it is the largest U.S. National Forest and is part of the largest expanse of temperate rain forest in the world. The Ketchikan Gateway Borough contains portions of the Tongass National Forest, which also completely surrounds the borough, along with the Misty Fiords National Mounment. The major climax forest type is mature western hemlock-Sitka spruce. Other tree species in the forest include western red cedar, Alaska or yellow cedar, mountain hemlock, red alder, Sitka alder, and lodgepole pine. The understory consists of skunk cabbage, red elderberry, salal, devil's club, rustyleaf, menziesia, salmonberry, thimbleberry, blueberry, huckleberry, ferns, mosses, and lichens (Ketchikan Gateway Borough, 1994).

Coniferous rain forests dominate the uplands within Gravina Island. A beach fringe vegetative community type parallels the coastline of Gravina Island. The community consists of Oregon crab apple, red alder, Sitka alder, willow, red-oiser dogwood, and grasses and sedges (Meehan, 1974).

## Major Land and Resource Ownership and Management

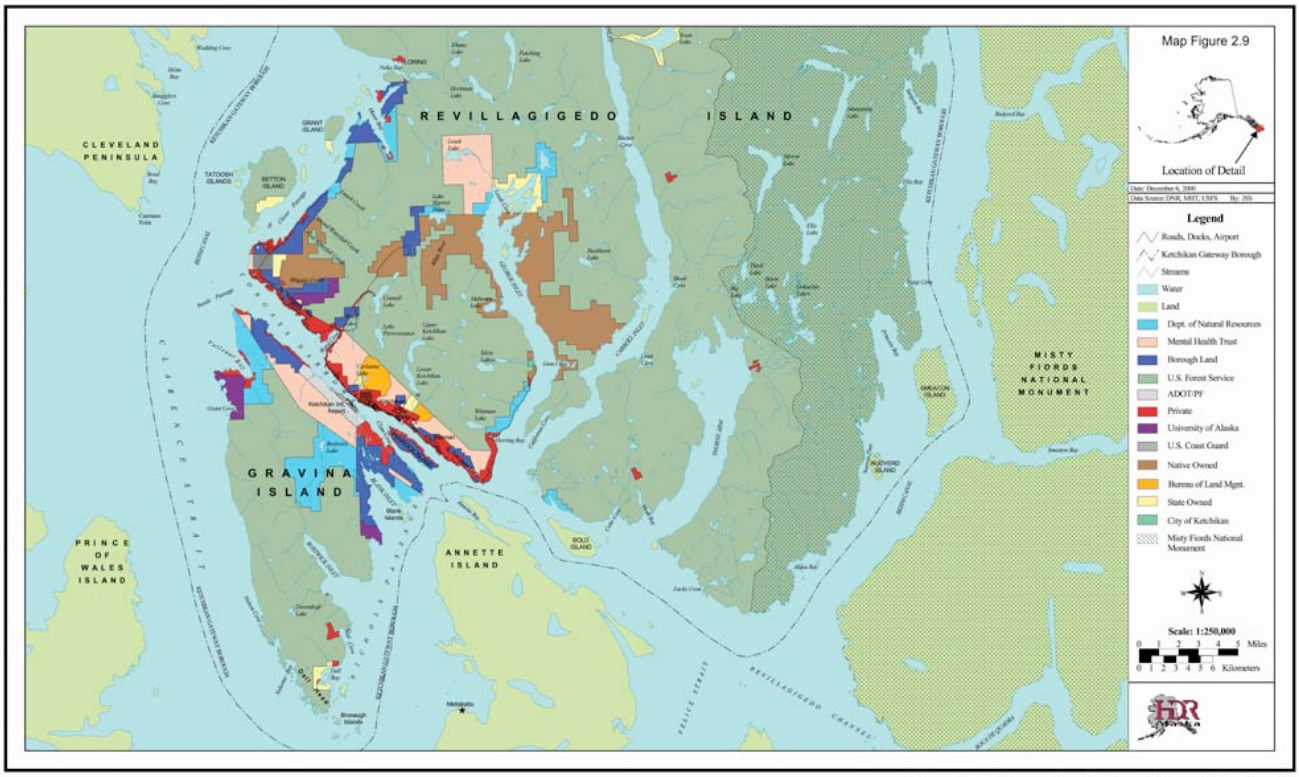
The Ketchikan Gateway Borough covers approximately 1,752 square miles of land. The primary landowners or managers are the U.S. Forest Service (USFS), (Ketchikan Ranger District); the State of Alaska Department of Natural Resources (DNR), Division of Lands; the Alaska Mental Health Trust Authority; the Ketchikan Gateway Borough; the University of Alaska; and private (including Native Corporations). See *Map Figures 2.9 and 2.10*, Generalized Borough-wide Land Ownership-South and Generalized Borough-wide Land Ownership-North and *Map Figure 2.11*, Land Ownership Detail. Issues pertaining to specific land ownership rights persist since the reevaluation and reapportionment of the Alaska Mental Health Trust Authority lands approximately three years ago. Clearly defining some property boundaries and ownership in the Borough is problematic. The borough's 1996 Comprehensive Plan provides the following distribution of ownership in the borough:

| | |
|---|---|
| Federal | 94.63% |
| Native | 2.87% |
| State | 1.41% |
| Private | 0.78% |
| Borough | 0.38% |
| City | 0.01% |



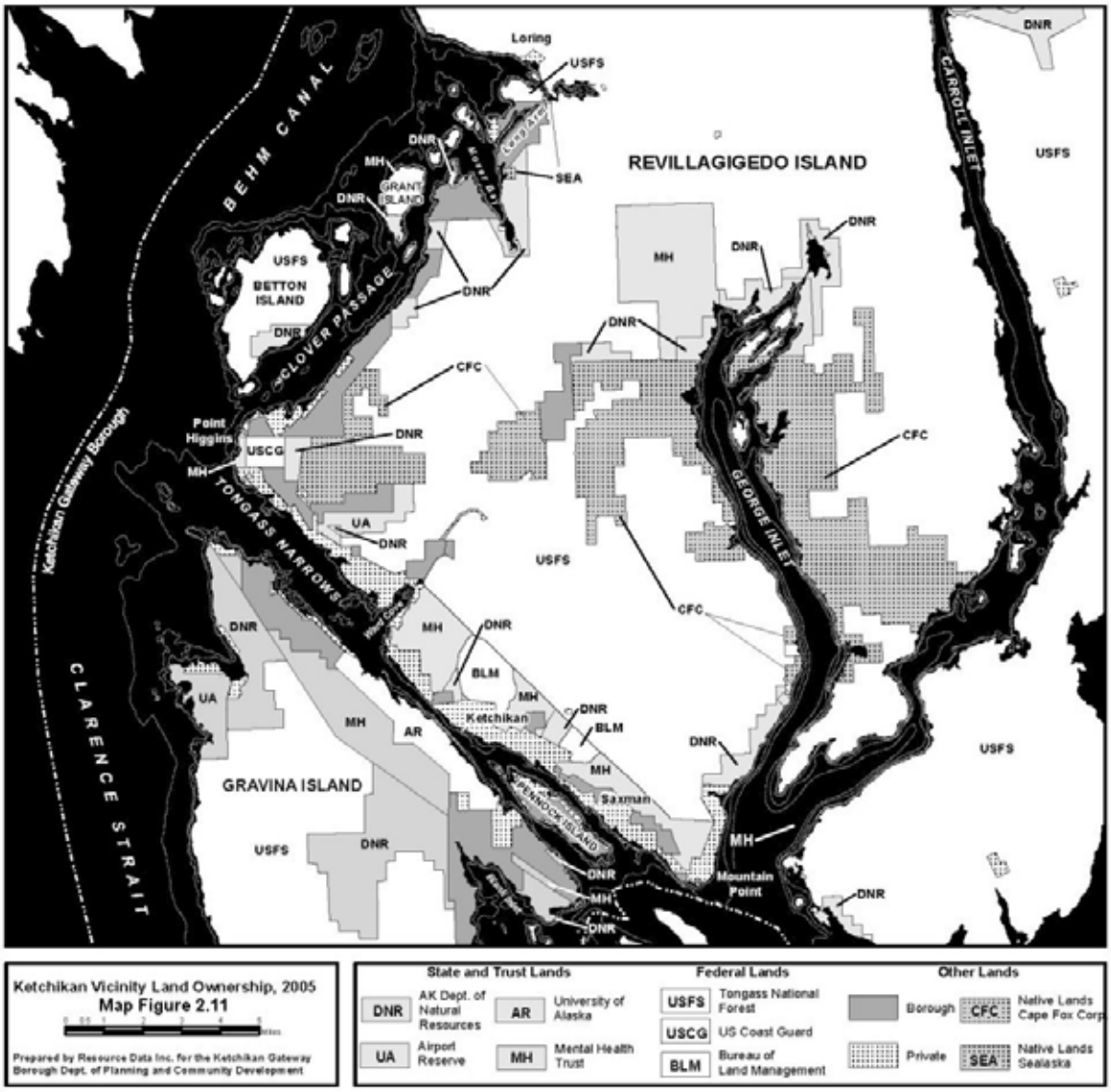

**Generalized Borough-wide Land Ownership: North***

*Consult Parcel Records for specific ownership information




**Generalized Borough-wide Land Ownership: South***

*Consult Parcel Records for specific ownership information


Loring
USFS
BEHM CANAL
DNR
MH
GRANT ISLAND
SEA
REVILLAGIGEDO ISLAND
CARROLL INLET
USFS
DNR
MH
DNR
USFS
BETTON ISLAND
DNR
DNR
GLOVER PASSAGE
DNR
CFC
Point Higgins
USCG
DNR
MH
TONGASS NARROWS
CFC
GEORGE INLET
UA
DNR
USFS
CFC
DNR
MH
DNR
BLM
MH
UA
Ketchikan
DNR
BLM
MH
AR
DNR
USFS
GRAVINA ISLAND
MH
Saxman
PENNOCK ISLAND
USFS
DNR
DNR
Mountain Point
MH
DNR
DNR
Ketchikan Gateway Borough
CLARENCE STRAIT
Ketchikan Vicinity Land Ownership, 2005
Map Figure 2.11
Prepared by Resource Data Inc. for the Ketchikan Gateway Borough Dept. of Planning and Community Development
State and Trust Lands
DNR AK Dept. of Natural Resources
AR University of Alaska
UA Airport Reserve
MH Mental Health Trust
Federal Lands
USFS Tongass National Forest
USCG US Coast Guard
BLM Bureau of Land Management
Other Lands
Borough
CFC Native Lands Cape Fox Corp
Private
SEA Native Lands Sealaska

### U.S. Forest Service

The land managed by the USFS in the Ketchikan Gateway Borough is part of the Tongass National Forest. The USFS provides a variety of land activities, uses, and resources in the Tongass National Forest.

The USFS owns the majority of land on Revillagigedo Island. The east coast along Behm Canal is part of Misty Fiords National Monument. Inland portions, dispersed throughout the region, are managed for timber production, remote and semi-remote recreation areas, scenic viewshed areas permitting timber harvest, natural landscapes permitting timber harvest, and maintenance of old-growth forests. Two parcels just outside the City of Ketchikan are managed as special interest areas: (1) the Ward Lake area established in 1948 and classified as a recreation area and managed for recreational, archaeological, historical, scenic, geological, botanical, or zoological values; and (2) Upper and Lower Ketchikan Lake area, managed as a municipal watershed. Orchard Creek in the northern portion of Revillagigedo Island will be managed as a wild, scenic, or recreational river to maintain and enhance the values of the river. The Naha River Recreation Area is designated a roadless area and is managed to permit fish and wildlife improvements and primitive recreation areas. The Naha River will be managed as a wild, scenic, or recreational river.

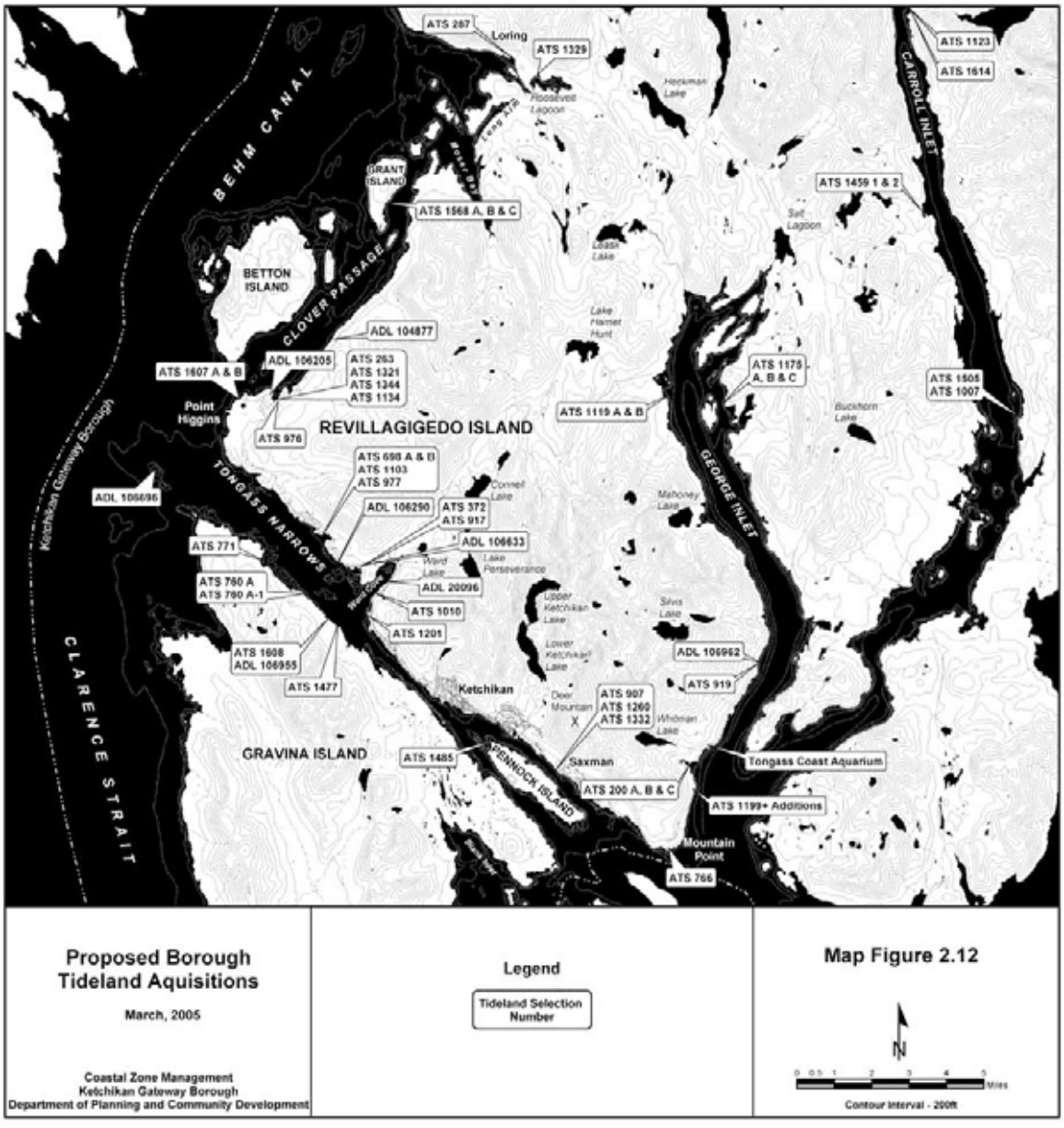
The USFS land on Gravina Island encompasses the western portion of the island along Clarence Strait and includes land parcels managed for several different resources. For example, the southern-most point of Gravina Island provides a scenic viewshed while permitting timber harvest. Some areas of southern Gravina Island are managed as potential mineral exploration sites, such as the Dall Head area. A large portion of the western coast of Gravina Island, along with other smaller parcels, has been classified to maintain old-growth forests for wildlife and fish habitat. The remaining USFS land on Gravina is in the middle of the island and on the southeastern coast, and is managed for maximum long-term timber production.

Further information on USFS land management is available from Tongass National Forest Land Management Plan Revision Final, August 11, 1996. Further information on Gravina Island can be found in the Gravina Island Development Plan (2005).

### Department of Natural Resources

The DNR land ownership consists of 13,657 acres on Revillagigedo Island, and 7,959 acres on Gravina Island. The largest parcels of state land on Gravina Island are located in the more remote areas south of California Ridge and in the Bostwick Lake/Creek area. The state also owns parcels of land scattered along the road system of Revillagigedo Island and near the Ketchikan International Airport on the northern shore of Gravina Island. Most of the state owned lands consist of tideland and submerged areas. Tideland units are located in 67 sites along the coast, representing the more sensitive habitat and environmental areas. During the planning period, the Borough expects to petition the state for local acquisition of key community interest tidelands. The tidelands proposed for acquisition are shown on *Map Figure 2.12*.

DNR manages its lands for a variety of uses, depending on size and location. Recreation, timber, habitat/wildlife, settlement, anadromous stream, marine-related recreation areas, and estuarine wetlands are some of DNR's managed resources. The following are the management prescriptions for some of the more prominent DNR holdings.


ATS 287
Loring
ATS 1329
ATS 1123
ATS 1614
CARROLL INLET
BEHM CANAL
GRANT ISLAND
ATS 1568 A, B & C
ATS 1459 1 & 2
BETTON ISLAND
CLOVER PASSAGE
ADL 104877
ATS 1607 A & B
ADL 106205
ATS 263
ATS 1321
ATS 1344
ATS 1134
ATS 1175 A, B & C
ATS 1505
ATS 1007
Point Higgins
ATS 976
REVILLAGIGEDO ISLAND
ATS 1119 A & B
ATS 698 A & B
ATS 1103
ATS 977
ADL 106696
ADL 106290
ATS 372
ATS 917
GEORGE INLET
ATS 771
ADL 106633
ADL 20096
ATS 760 A
ATS 760 A-1
ATS 1010
ATS 1201
ATS 1608
ADL 106955
ATS 1477
ADL 106962
ATS 919
Ketchikan
ATS 907
ATS 1260
ATS 1332
GRAVINA ISLAND
ATS 1485
Saxman
Tongass Coast Aquarium
ATS 200 A, B & C
ATS 1199+ Additions
PENNOCK ISLAND
Mountain Point
ATS 766
Ketchikan Gateway Borough
CLARENCE STRAIT
Proposed Borough Tideland Aquisitions
March, 2005
Coastal Zone Management
Ketchikan Gateway Borough
Department of Planning and Community Development
Legend
Tideland Selection Number
Map Figure 2.12
N
0 0.5 1 2 3 4 5 Miles
Contour interval - 200ft

- Unit K-39, the west coast of Upper George Inlet north of Herring Bay on Revillagigedo Island, is managed for recreation, scenic viewshed, habitat/wildlife, and public facilities (aquarium).

- Unit K-21, the Upper Trollers Creek Watershed on Revillagigedo Island, is managed for settlement, timber, anadromous stream, and water supply.

- Unit K-41, a large parcel of land located in central Gravina Island, including Curve Mountain and Bostwick Creek drainage and Bostwick Lake, is managed for recreation, timber, wetlands, and habitat/wildlife.

- Unit K-25, in the northern peninsula of Gravina Island, is managed for commercial forest, dispersed recreation activity primarily related to hunting, and maintenance of important habitat areas and wildlife movement corridors.

- Unit K-28, a coastal plain on Gravina Island, is managed for estuarine wetlands and anadromous streams.

The Central/Southern Southeast Area Plan Public Review Draft (December 1999) contains detailed information on DNR-owned land, including more specific data on the above-mentioned units and all other units owned and managed by DNR.

### Mental Health Lands Trust

The Mental Health Lands Trust owns a considerable amount of land within and adjacent to the City of Ketchikan, and on Pennock and Gravina Islands. Trust Lands are managed solely in the best interest of the Alaska Mental Health Trust and its beneficiaries in compliance with the following key principles and objectives:

- Loyalty to the Trust and its beneficiaries
- Maximization of long-term revenue from Trust Land
- Protection and enhancement of Trust assets
- Encouragement of a diversity of revenue-generating activities on Trust Land
- Accountability to the Trust and its beneficiaries
- To be a good neighbor

Trust lands contain revenue resources such as timber, settlement, and recreation. It is expected that these will be developed during the planning period.

### University Land

The University of Alaska Lands Trust holds title to land located at Vallenar Bay and Blank Inlet on Gravina Island, and on Revillagigedo Island at Whipple Creek, Settlers Cove, Mountain Point, and Leask and Bat coves. The Whipple Creek land was harvested in the early 1990s. The basic intent of the University's holdings is management for eventual disposal or income generation from revenue sources such as timber, settlement, and recreation.

### Ketchikan Gateway Borough

The Ketchikan Gateway Borough owns land on Revillagigedo, Gravina, and Pennock Islands. The Borough lands are primarily managed for potential residential and community development, recreation, watersheds, commercial, and industrial uses. Also, disposal of lands to private individuals is intended and expected. Borough land is managed according to the goals of the Ketchikan Gateway Borough's 1996 Comprehensive Plan. In particular, the following excepts from the plan covers management and disposal of the Borough's land holdings:

**Goal:** Manage Borough lands for the health, welfare, and economy of the community.

Strategy 1: Manage Borough Lands for a variety of uses.
Strategy 2: Manage Borough-owned lands in an economically efficient manner.
Strategy 3: Identify Borough-owned lands suitable for industrial, commercial, recreational, and residential development.
Strategy 4: Identify Borough-owned lands suitable for quality, affordable housing.
Strategy 5: Identify Borough-owned lands for green belts and neighborhood parks (and incorporate into neighborhood plans).
Strategy 6: Identify and designate Borough-owned lands for passive use and other uses, such as recreation, visual quality, habitat, education, cultural, open space, and natural areas.
Strategy 7: Consider and recognize uses of adjacent lands when designating Borough land use.
Strategy 8: The Borough should encourage, whenever possible, the State of Alaska and Division of Natural Resources to facilitate the transfer of title of Borough Lands.
Strategy 9: Conserve natural resources.
Strategy 10: Maintain clean air and water.

The Ketchikan Gateway Borough's 1996 Comprehensive Plan and the 1989 CMP include a detailed description of land management practices in the Borough.

### Private Land Ownership

Privately owned lands on Revillagigedo Island are generally concentrated along Tongass Narrows. Moser Bay, Vallenar Bay, Upper George Inlet, and Carroll Inlet also include privately owned lands from previous Borough, state, and Native corporation remote shareholder subdivisions. The Cape Fox Native Corporation is the largest holder of private land. The Cape Fox land is managed both to generate income for the Native shareholders and to provide timber, fish, and wildlife opportunities, for future generations. Privately owned lands are managed according to the Ketchikan Gateway Borough Comprehensive Plan (1996), the CMP, and the borough zoning code.

## Major Land and Water Uses

Land and water use alternatives in Ketchikan are constrained by an insufficient supply of flat, dry, privately owned, road accessible land. As a result, residential, recreational, institutional, industrial, and service commercial land development is concentrated along a narrow, 30 mile long strip of shoreline. This sometimes results in land use conflicts and makes community expansion difficult and expensive. In fact, many areas downtown and some outside the city are built upon piers in the inter-tidal area due to the lack of suitable upland areas. Some parts of this road accessible shoreline also have high natural resource values such as salmon streams, estuaries, and

near shore fish habitats. Map Figures 2.13 and 2.14 illustrate the developed and developing areas of the Borough as well as areas suitable various types of community expansion. The adjacent waterfront is also an area of high commercial, residential and recreational marine traffic. Impacts to these resources can sometimes be unavoidable due to community growth needs and the lack of private, accessible land elsewhere in the community. The minimization of impacts to coastal resources in these areas presents an additional cost to developing the limited land supply. In addition, it is important to adequately consider the effects of new development on other important aspects of the community including mountain and water views and public access to the waterfront. Figure 2.6 illustrates developed areas of the Borough and those areas likely to develop further during the planning period. Figure 2.7 illustrates those areas, located within the existing land supply, that are suitable for industrial, commercial, and residential expansion.

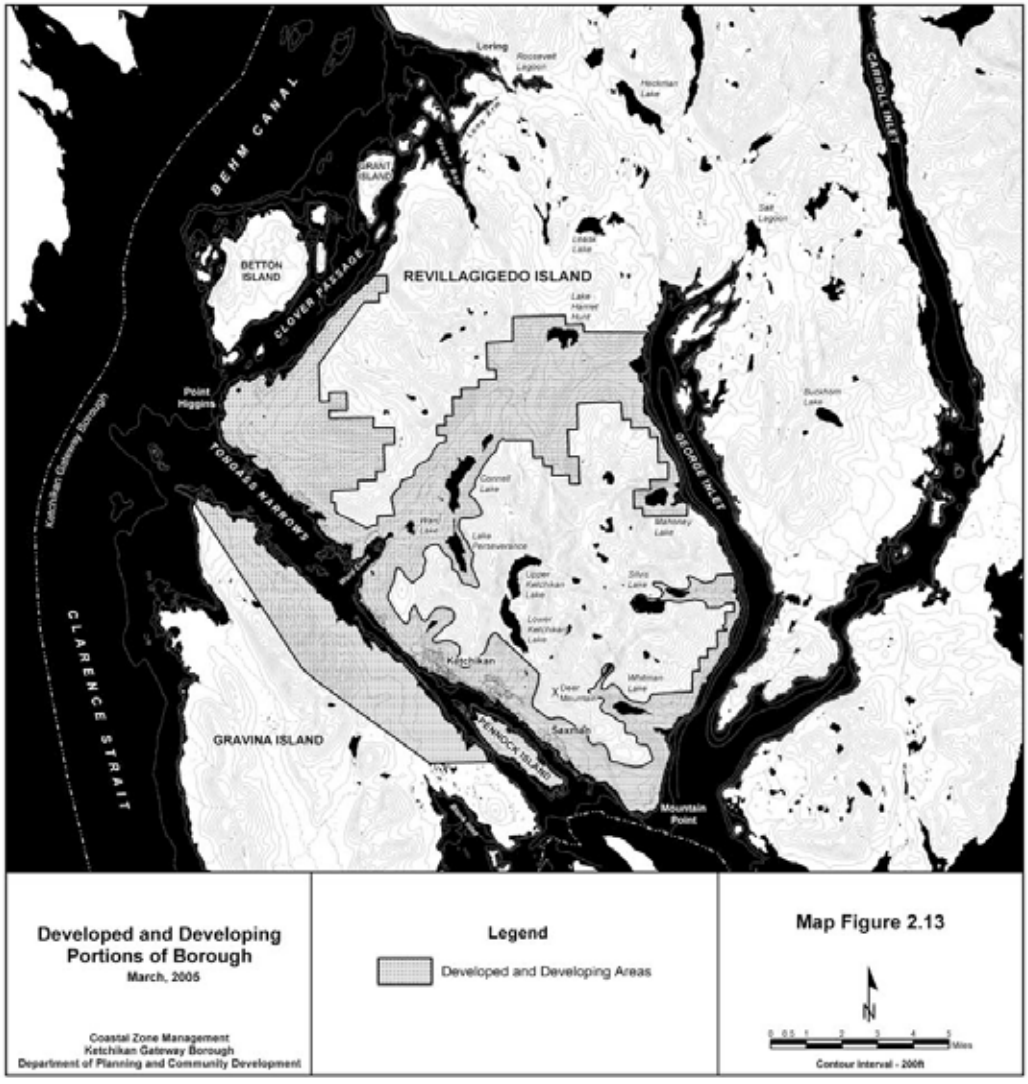
The need for access to developable land has been described in many planning studies conducted over the past twenty years. Most recently, the Gravina Access Draft Environmental Impact Statement (DEIS) (August 6th, 2003) described the various problems posed by the scarcity of suitable vacant land for community expansion and the need for improved access to Gravina Island. It noted the following:

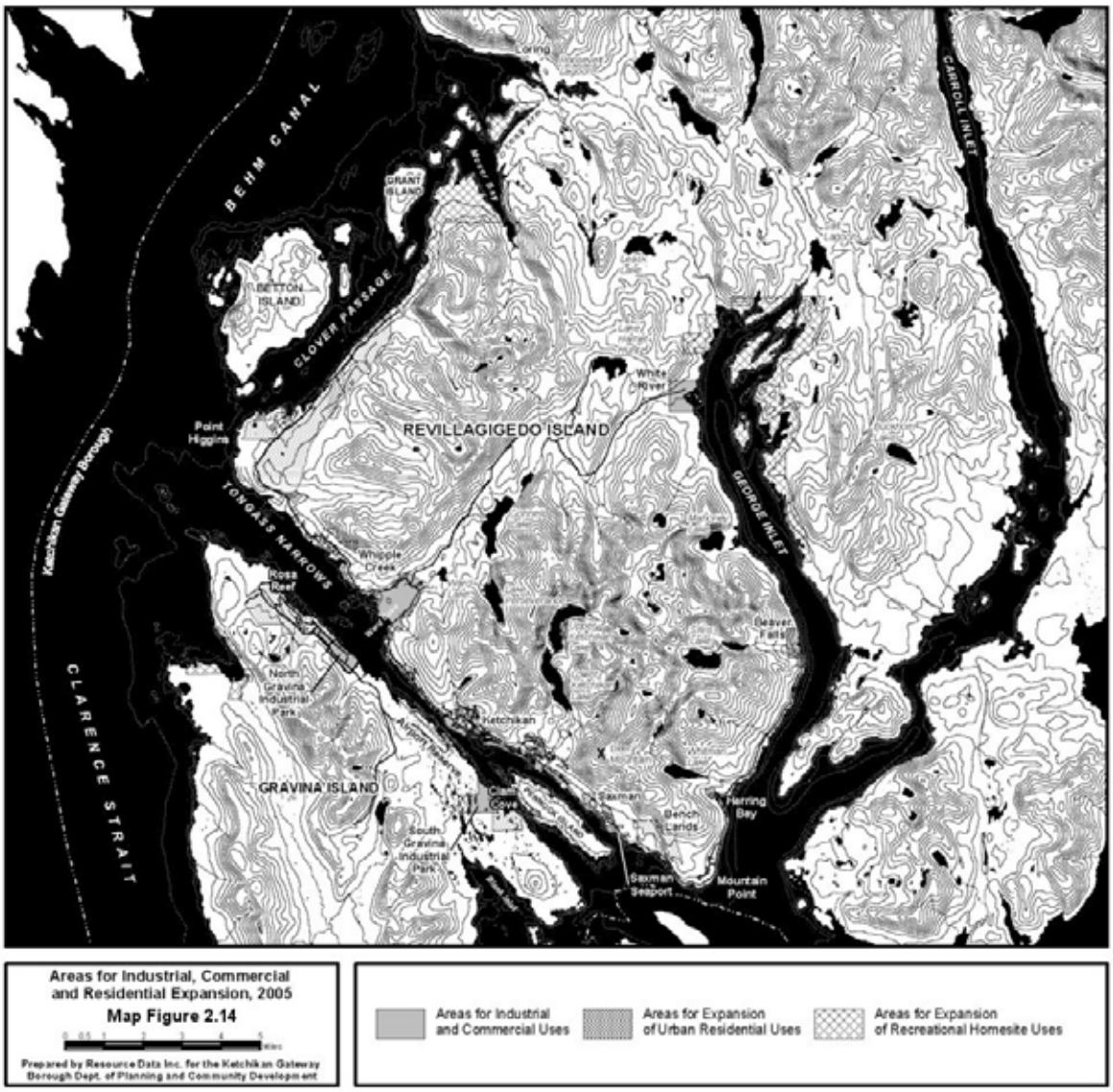
- Relatively high community land costs (due to low supply and high demand)
- Loss of business opportunities
- Increased pressure to develop lands that are environmentally marginal in terms of development potential (e.g. wetlands and steep slopes), which is an unsound land management practice
- High land development costs (because developing the environmentally marginal lands is extremely costly
- Development patterns that result in inappropriate or incompatible land use for some geographic locations (e.g., waterfront development that excludes water access dependent industries).

The DEIS goes on to note that without access to expansion areas, development will continue to crowd the waterfronts of Revillagigedo and Gravina Islands simply because the waterfronts are accessible from the road system.

In the fall of 1995, the Borough conducted a vacant land-use survey along the waterfront road system from Settler's Cove to Herring Cove. Although the survey identified approximately 1,250 vacant parcels of land, the Borough's 1996 Comprehensive Plan noted that "topographical constraints might physically rule out development on many of these sites, or make them prohibitively expensive to develop." The plan observed that while there appeared to be a "sufficient land base to satisfy the community's short-term future needs for residentially zoned property", that commercial and industrial properties, particularly those with waterfront access were "perceived to be in short supply."

A 1996 survey of actual land-use along the waterfront road system determined that, with few exceptions, commercial and industrial development occurred adjacent to the highway corridor, interspersed with residential development either immediately adjacent to it or directly opposite across the highway. The survey concluded that "In part, because of the scarcity of developable land for commercial and industrial purposes, adjacent conflicting land uses are prevalent in the Borough"


BEHM CANAL
BETTON ISLAND
CLOVER PASSAGE
REVILLAGIGEDO ISLAND
CARROLL INLET
GEORGE INLET
TONGASS NARROWS
CLARENCE STRAIT
GRAVINA ISLAND
Point Higgins
Ketchikan Gateway Borough
Mountain Point
Developed and Developing Portions of Borough
March, 2005
Coastal Zone Management
Ketchikan Gateway Borough
Department of Planning and Community Development
Legend
Developed and Developing Areas
Map Figure 2.13
N
Contour Interval - 200ft


BEHM CANAL
CARROLL INLET
GRANT ISLAND
BETTON ISLAND
CLOVER PASSAGE
Loring
White River
REVILLAGIGEDO ISLAND
Point Higgins
Ketchikan Gateway Borough
TONGASS NARROWS
GEORGE INLET
Whipple Creek
Ross Reef
Beaver Falls
Norm Gravina Industrial Park
Ketchikan
GRAVINA ISLAND
Clover Cove
Saxman
Herring Bay
Bench Lands
South Gravina Industrial Park
Saxman Seaport
Mountain Point
CLARENCE STRAIT
Areas for Industrial, Commercial and Residential Expansion, 2005
Map Figure 2.14
Prepared by Resource Data Inc. for the Ketchikan Gateway Borough Dept. of Planning and Community Development
Areas for Industrial and Commercial Uses
Areas for Expansion of Urban Residential Uses
Areas for Expansion of Recreational Homesite Uses

Ketchikan's limited land supply coupled with anticipated community growth needs will continue to place increasingly difficult demands on coastal resource management. In some cases, coastal expansion lands and near shore habitats will be only marginally suitable for development. Resource suitability will drive the need for thorough consideration of public need and development alternative analysis during project review. In summary, there is a reasonable and foreseeable need to manage the placement of fill and structures in coastal waters in a manner that balances the needs of adjacent upland property owners against the community-wide public needs for access, navigation, views, and habitat management.

The shoreline provides accessory or primary access to much of the developing area of the coastal district which underscores the need to manage the placement of structures to avoid impacts to navigation, views and marine life; and preserve access to surrounding property. Balancing these often competing concerns is a matter of local concern. Tools to prohibit the use of creosote as a treatment to preserve wood structures placed in marine waters are necessary to address these local concerns. Creosote, a combination of 432 chemicals, 20 of which are poly-cyclic aromatic hydrocarbons (PAHs), is a pesticide. It is toxic to both humans and marine life, and although not specifically prohibited by state or federal laws, leaches from treated wood along shorelines into the soil and, can be taken up by marine animals and plants (Anderson, M.; Padilla Bay NERR 2004).

# Natural Hazards

## Resource Inventory

### Landslides and Mass Wasting

Landslides and mass wasting are relatively common in the Ketchikan region and can pose potential problems to development depending upon specific site and slope conditions. Wet soils may not hold tall trees firmly and during periods of heavy precipitation, landslide probability increases. Detailed information pertaining to the potential for landslides in the Ketchikan Gateway Borough is available from the Phase 1 Geotechnical Report for the Gravina Access Project (Shannon & Wilson, Inc. 2000).

### Wind

An analysis of wind climatology in Tongass Narrows, based on 25 years of hourly data from the Ketchikan Airport, indicates that the 100-year return wind (expected value of one-minute average) is 74 knots (85 mph) and the 100-year return gust (expected value) is 113 knots (130 mph). The excess soil moisture causes tree roots to develop in the surface layers (of often shallow soil), leaving the mature trees highly susceptible to blow down.

### Earthquakes

Numerous faults are present and major earthquakes are common in Alaska. Ketchikan, however, is a significant distance from major seismic activity. The largest earthquakes near the region occurred in August 1949 and July 1972. The 1949 earthquake was located approximately 100 miles southwest of the region and the 1972 earthquake approximately 110 miles northwest of the region. Some ground shaking from the 1972 earthquake was recorded. Lemke (1975) places Ketchikan in Zone 2, which means the largest earthquake would range from 4.5 to 6.0 with moderate damage to structures. The U.S. Army Corps of Engineers considers Ketchikan to be in Zone 3, with strong earthquakes at a magnitude of 6 or greater to be expected. Local Building Codes require construction to conform to zone 2B design requirements. Further information pertaining to geologic hazards associated with seismic activity in the Borough is available from the Phase 1 Geotechnical Report for the Gravina Access Project (Shannon & Wilson, Inc., 2000).

### Flooding

The Federal Emergency Management Agency (FEMA) has mapped the expected 100-year floodplain for a small portion of the Ketchikan Gateway Borough (i.e., primary population areas). The limits of the FEMA study extend from one-half mile north of Carlanna Creek to the Coast Guard Station within the City of Ketchikan. Much of the City of Ketchikan, including the Schoenbar, Hoadley, Whipple and Carlanna Creek areas lie within the floodplain of a 100-year flood (FEMA 1990). Although FEMA has not determined floodplains for areas outside the city, the Borough has adopted Flood Damage Prevention Standards that establish a minimum building pad elevation of 22 feet above sea level. However, because of the steep mountain slopes and the small size of the watersheds, flooding is not expected to be significant.

# Recreation

## Resource Inventory

Opportunities for a wide variety of recreation activities are present throughout the Borough. The following inventory includes those areas considered or designated as recreational use areas.

The Borough's parks and recreation system consists of miles of beaches, three athletic fields, two swimming pools, parks, and properties in reserve. The USFS manages trails, remote cabins, campgrounds, recreation areas, and the Misty Fjords National Monument. The Alaska Division of Parks and Outdoor Recreation (Division of Parks) maintains Settlers Cove State Park, Totem Bight State Historic Park, and Refuge Cove State Recreation Area. Clover Pass is one of the Borough's main boating and sport fishing areas, and is highly regarded for its scenic value. With its three marinas, and three resorts, the area is also very popular with sport fishermen for nearshore and openwater fishing, as well as diving. On Gravina Island, there is Black Sands State Beach and the proposed Dall Bay State Marine Park. Betton Island, Grant Island, and Traitors Cove are potential sites for future state marine parks. Fishing, hunting, biking, hiking, boating, diving, kayaking, camping, and wildlife viewing are some of the popular outdoor activities offered throughout the Ketchikan Gateway Borough. *Table 4.1* list various recreation and use areas in the Borough. *Table 4.2* lists locations designated for recreational use, the recreational activities at each location, and the unique features of each location listed for protection. Map *Figure 4.3* illustrates in general areas in the Borough used for recreation and commercial tourism use. See Volume I of the CZM Plan for specific areas designated for recreation use.

The Ketchikan Gateway Borough Parks and Recreation Plan (1994) and the Ketchikan Recreation Demand Analysis by the McDowell Group (1993) offer more detailed information on recreation in Ketchikan. The Existing Conditions Report of the Demographics and Socioeconomics Analysis for Ketchikan 2020 and the Gravina Access Project (HDR 2000) provides a detailed analysis of the economy of the Ketchikan Gateway Borough with respect to recreational trends.

**Table 4-1.Ketchikan Borough Recreation and Use Areas**

| | |
|---|---|
| **Wild, Scenic and Recreational Rivers** | |
| • *Gokachin, Mirror, Fish, and Low Creeks* | • *Orchard Creek and Lake* |
| • *Naha River* | • *Wolverine Creek, McDonald Lake* |
| **State Marine Parks** | |
| • *Betton Island – proposed* | • *Grant Island – proposed* |
| • *Black Sands Beach – state marine beach, undeveloped* | • *Traitors Cove/Virgin Bay Marine Park* |
| • *Dall Bay – proposed* | |
| **Dispersed Recreation Areas** | |
| • *Lower Carroll Creek* | • *Mountain Ranges and Alpine Area between Ketchikan, Ward Lake-Hariett Hunt Lake Road, and George Inlet.* |
| **Forest Service Recreation Cabins** | |
| • Anchor Pass – incl. Pass | • Orchard Lake – incl. lake |
| • Blind Pass – incl. Pass | • Patching Lake – incl. lake |
| • Deer Mountain | • Phocena Cove – incl. cove |
| • Fish Creek incl. around buoy | • Plenty Cutthroat – incl. lake |
| • Fisheries Cabin – incl. Lake | • Portage Cabin – incl. lake |
| • Heckman Lake – incl. Lake | • Rainbow Lake - incl. lake |
| • Helm Bay – incl. Bay | • Reflection Lake & Shelter – incl. lake |
| • Helm Lake – incl. stream and lake | • Shelokum Lake Shelter – area and lake |
| • Jordan Lake – incl. Lake | • Smugglers Cove Shelter – incl. lake |

- Long Lake Shelter – incl. lake
- McDonald Lake & Shelter – incl. lake
- Wolf Lake Shelter – incl. lake

**Private Resorts**

- Clover Pass Resort
- Salmon Falls Resort
- George Inlet Lodge
- Beacon Hill Lodge
- Silver King Lodge
- Yes Bay Resort
- Rocky Bay Lodge
- Cedars Lodge

**Developed Recreation Areas**

- Settlers Cove (State Campground)
- Swan Lake Dock & Picnic Area
- Rotary (a.k.a Bugge) Beach
- Ward Lake Recreation Area
- Totem Bight State Park
- Lake Harret Hunt

**Hiking Trails**

- Bailey Bay-Shelokum Lake (#927010)
- Bell Island Trail (#927030)
- Black Mountain Lakes Trail
- Coast Guard Beach Trail
- Connell Lake Trail
- Deer Mountain Trail (#927060)
- Fish Creek-Low Lake Trail
- Gokachin Lake Trail (#927110)
- Long Lake Trail (#927190)
- Lunch Creek Trail
- McDonald Lake Trail (#927450)
- Meyers Chuck Trail (#927830)
- Brown Mountain Alpine Trail
- Married Man's Trail
- Schoenbar Bar Trail
- Naha River Trail (#929250)
- Orchard Lake Trail (#927320)
- Perseverance Lake Trail (#927260)
- Rainbird Trail
- Reflection Lake Trail (#927310)
- Second Waterfall Creek Trail
- Silvis Lake Trail
- Smugglers Lake Trail
- Titan Trail (Hyder) (#957550)
- Ward Creek Trail
- Ward Lake Nature Trail
- Wolf Lake Trail (#927440)
- Minerva Mountain
- Leask Lakes Trail
- Salvage Road Trail

**Routes not constructed nor NEPA cleared: Planned or Opportunities**

- Harriet Hunt – Shelter Cove Road connecting to road off the island to the Bradfield Canal
- Potential Trail corridor between Harriet Hunt Lake, Leask Lake, and Wolf Lakes
- Minerva Mountain Trail Expansion
- Achilles Mountain
- Shelter Cove Boat Ramp
- Slide Ridge Winter Sports Area
- Lunch Creek Trail Expansion
- Saddle Lakes Recreation Area

**Saltwater Use Areas**

- Anchor Pass
- Bailey Bay
- Behm Narrows
- Bell Arm
- Blank Inlet
- Blind Pass
- Bond Bay
- Bostwick Inlet
- Carroll Inlet
- Cleveland Peninsula from Caamano Pt. to Niblack Pt. ( _ mi. off shore)
- Clover Pass
- Dall Bay
- Felice Strait
- Gedney Pass including Convenient Cove
- George Inlet
- Hassler Pass
- Helm Bay
- Klu Bay
- Moser Bay
- Moth Bay
- Naha Bay
- NE corner of Thorne Arm (Fish Ck to Gokachin Ck)
- Neets Bay
- Nichols Passage – Blank Inlet to Bostwick Inlet
- Port Stewart
- Revillagigedo Channel to Thorne Arm
- Short Bay
- Shrimp Bay
- Smugglers Cove
- Spacious Bay
- Thorne Arm
- Tongass Narrows
- Traitors Cove
- Union Bay
- Vallenar Bay – Vallenar Point
- Vixen Inlet
- West Behm Canal
- Yes Bay

Source: U.S. Forest Service Land and Resource Management Plan – Tongass National Forest 1997

The Borough Planning Department, in 2002, conducted a survey among various user groups and agency personnel, regarding the location, activities, and protected features of various recreational beaches in the community. *Table 4.2* reflects the outcome of this research and lists those areas

designated for recreational use. These areas receive significant use by local residents and visitors or the areas have potential for recreational use because of physical, biological features.

## Resource Analysis

Ketchikan's recreation resources are subject to the changing needs and demands among various users. The suitability of recreational areas for continued recreational use usually depends on specific natural features or habitats which can be easily changed by development. It is important to manage the activities and the features of these areas in a manner which safeguards their values as destinations for visitors and local residents.

Land and waters throughout the Borough offer a variety of recreation opportunities in coastal areas for residents and visitors. Hunting, fishing, biking, kayaking, hiking, diving, boating, and wildlife viewing are some of the activities pursued in the district. The Alaska Division of Parks and the USFS maintain several parks and recreation areas.

The specific present and anticipated recreation needs include:

- Construction of bike and pedestrian paths – urban and non-urban
- Increasing public access to and within designated recreation areas
- Construction of an aquarium near Whitman Creek
- Construction of bridge access to Gravina Island
- Development of new roaded recreation destinations for locals and visitors
- Implementation of the Trails Ketchikan plan
- Establishment of proposed marine parks at Grant Island, Betton Island, and Dall Bay
- Construction of additional harbor, boat launch and mooring facilities
- Construction of a golf course
- Construction of a running track and athletic fields

Recreation facilities and access to the coastline provide direct, positive benefits to residents and visitors and contribute to economic stability and quality of life. Proper siting and design of recreation areas such as hiking trails and parks and coastal access is important to maintain compatibility with surrounding development or critical habitat. In some instances, there can be competition for recreation facilities between visitors and locals. This underscores the importance of dispersing rather than concentrating recreation facilities.

Many natural areas in the Borough are suitable for a variety of active and passive recreation uses. As the use and popularity of recreational areas increase, some areas may become subject to overuse, which might diminish other resource values for personal use hunting or fishing. Good management of marine waterways, lakes, and streams is necessary to avoid impacts resulting from overuse. In addition, provision of proper waste handling facilities in public harbors is necessary to protect water quality. Development of major new recreation facilities, such as an athletic field, will inevitably require permits for development in wetlands.

During the planning of new recreation areas and facilities, it will be important to consider the expectations of various users to avoid conflicts with other uses. For example, users of remote recreation areas may desire less evidence of development impacts and activities while users of in-

Table 4.2
**Areas Designated for Recreation and Tourism**

| LOCATION | | | ACTIVITY | | | | | | | | | | PROTECTED FEATURES | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Map No. in Vol. | Beach Name and Location (See Map Figures in Volume I. for Location Boundaries) | Beach Access | Swimming | Beachcombing Walking Hiking | SCUBA | Kayaking | Boating | Camping | Harvesting Coastal Marine Resources | Coastal Education; Used by KGB Schools | Bird and Wildlife | Appropriate for Commercial Recreation and Tourism | Rocky Beach | Gentle, Sandy Beach | Intertidal Marine Life | Pelagic Marine Life | Benthic Subtidal Marine Life | Trails & Rec. | Beach and Intertidal Plants | Wildlife Habitat | Historic and Archeological Features |
| 3.2 | Settler' Cove State Park 55°31'x131°30' | 18 Mile NTG and Clover Passage | X | X | X | Good Launch | | X | Humpy Shore Fishing | Beach Day | X | NO | X | X | X | Salmon | X | X | | X | |
| 3.3 | Coast Guard Beach 74S;89E | Point Higgins Trail End and Clover Passage | X | X | | X | | X | Edible Plants | Beach Day | | NO | X | | X | | | X | X | | |
| 3.4 | South Point Higgins Beach 55°30'x131°45' | South Point Higgins Road | X | X | X | X | | X | Herring Egg Spawn | Survival Camp | | NO | X | | X | Herring | X | | X | | |
| 3.5 | Totem Bight State Park 55°28'x131°40' | 10 Mile NTG and Tongass Narrows | X | X | X | Good Launch | | | | | | YES | | X | X | | X | X | | | Totem Park |
| 3.6 | Refuge Cove Beach 55°26'x131°30' | Sunset Drive and Tongass Narrows | X | X | X | X | | | Fishing | Beach Day | | NO | X | | | Salmon | | | | | |
| 3.7 | Waterfall Neighborhood Shorline 55°29' x 131°45' | Mile 16 N. Tongass Hwy. and Clover Pass | | X | | X | | | | | | NO | X | | | Salmon | | | | | |
| 3.8 | Long Arm Shoreline | Clover Passage | | X | | X | X | X | | | | NO | X | | | | | X | | | |
| 3.9 | North Clover Pass Open Space | Clover Passage and Moser Bay | | X | | X | | X | | | | NO | X | X | X | Salmon | X | X | X | | |
| 3.10 | Grant and Joe Islands Marine Park | Clover Passage | | X | | X | X | X | | | X | YES | X | X | X | Salmon | X | X | X | X | Joe Island |
| 3.11 | Clover Pass Park & Shoreline Trail (Nortth) | Clover Passage/Hiking | X | X | X | X | X | X | X | X | X | NO | X | X | X | Salmon | X | X | X | X | |
| 3.12 | Clover Pass Park & Shoreline Trail (South) | Mile 17 N. Tongass Hwy. and Clover Pass | | X | | X | X | X | | | | NO | X | X | X | Salmon | X | X | X | X | |
| 3.13 | Betton Island Marine Park Proposed by State Parks 55°31'x131°345' | Clover Passage | X | X | X | X | X | X | Fishing | | | NO | X | X | X | Salmon | X | X | X | X | |
| 3.14 | North Gravina Beaches | Tongass Narrows/Hiking | | X | | X | X | X | Fishing | | | NO | X | X | X | | X | X | X | X | |
| 3.15 | High Mountain Creek Beach | Tongass Narrows/Hiking | | X | | X | X | X | | X | X | NO | X | X | X | | X | X | X | X | |
| 3.16 | Gravina Shoreline Trail | Ferry/Hiking | | X | | X | X | | | X | X | NO | X | X | X | | X | X | X | | |
| 3.17 | Bostwick Lake Recreation Area | None/Uplands Lake Hiking | X | X | | | | X | Fresh Water Fishing | X | X | NO | | | | | | X | | X | |
| 3.18 | Bostwick Lake Loop Trail | Ferry/Hiking | | X | | | | X | | X | X | NO | | | | | | X | | X | |
| 3.19 | Gravina Lake Country | Hiking | | X | | | | X | | X | X | NO | | | | | | X | | X | |
| 3.20 | Dall Bay Marine Park Proposed by State Parks 55°10'x131°32' | Dall Bay | | X | X | X | X | X | Fishing | | | NO | X | | X | Salmon | X | | | Seals Birds Deer | Old Cannery |
| 3.21 | Black Sands Beach | Tongass Narrows | X | X | | X | X | X | | | X | NO | | X | | | | X | | | |
| 3.22 | Rotary Beach 76S;91E | 3.5 Mile STG and Tongass Narrows | X | X | X | Good Launch | | | Fishing | Beach Day | | NO | X | X | X | Salmon | X | | | | |
| 3.23 | Mountain Point/Surprise Beach 76S;91E | 5.5 Mile STG; Tongass Narrows | X | | X | Good Launch | Boat Ramp | | Shore fising | | | YES | X | X | | Salmon | | | | | |
| 3.24 | Herring Cove and Tidal Meadow 75S;91E | Mile 8 STG to Wood Road; George Inlet | X | X | | X | | | Fishing | | X | YES | X | X | | | | | | Seals Bears Birds | |

Table 4.2 (continued)
**Areas Designated for Recreation and Tourism**

| LOCATION | | | ACTIVITY | | | | | | | | | | | PROTECTED FEATURES | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Map No. in Vol I | Beach Name and Location (See Map Figures in Volume I for Location Boundaries) | Beach Access | Beaching | Beachcombing Walking Along | Cliffs | Kayaking | Boating | Camping | Harvesting Coastal Marine Resources | Coastal Education, Identity with Schools | Bird and Wildlife Viewing | Appropriate for Commercial Recreation and Tourism | Rocky Beach | Sandy, Sandy Beach | Intertidal Marine Life | Pelagic Marine Life | Benthic Subtidal Marine Life | Trails & Rec | Beach and Intertidal Parks | Wildlife Habitat | Historic and Archeological Features |
| 3.25 | Totem Coast Aquarium | Mile 0.5 TH | | | | | | | | X | | YES | X | | | X | | X | X | X | |
| 3.26 | Vallenar Bay Shoreline | Vallenar Bay | X | X | | X | X | | X | | X | YES | X | | X | X | X | X | X | X | |
| 3.27 | Moser Bay Estuary | Moser Bay | X | X | | X | X | X | X | | X | YES | X | | X | X | | X | X | X | |
| 3.28 | Salt Lagoon Creek; Head of George Inlet: 55°52'x131°05' | George Inlet | | | X | X | | | X | | | NO | | Salt Lagoon | X | Salmon | X | | X | Birds, Bears, Fish | |
| 3.29 | Joseph O. Williams Sr./South Tongass Coastal Trail | Limited | | X | | | | | | | X | NO | | | | | | X | | | X |
| 3.30 | Ketchikan Creek Corridor | None | | X | | | | | Stream Fishing | X | X | YES | | | | | | X | | X | |
| 3.31 | Ward Creek/Ward Lake Recreation Area | None | X | X | | X | X | X | Lake and Stream Fishing | X | X | Limited | | | | | | X | | X | |
| 3.32 | Fish Creek/Low Lake Trail | Thorne Arm | | X | | X | X | X | Fresh Water Fishing | | X | NO | X | | X | X | X | X | X | X | |
| 3.33 | Wolf Creek and Wolf Lakes | Moser Bay | | | | | | X | Fresh Water Fishing | | X | NO | X | | | | | X | X | X | |
| 3.34 | Naha Bay | Naha Bay | X | X | | X | X | X | Salt Water Fishing | | X | NO | X | | X | X | | X | X | X | X |
| | Boskofski Inlet (Not Mapped) | Nichols Passage | | X | | X | X | X | Fishing | | | NO | X | | X | Salmon, Crab | X | X | X | Bears, Deer | |
| | Tatoosh Islands 735,888' (Not Mapped) | Clover Passage | | | X | X | X | | Fishing | | X | YES | X | | X | Salmon | X | | | Seals | |
| | Sam Cove; East Shoreline of George Inlet: 755,92E (Not Mapped) | George Inlet | | | | X | X | | | | | NO | | Salt Chuck | | | | | | | |
| | Mahoney Inlet: 745,91E Not Mapped) | George Inlet | | X | | X | X | | | | | NO | | | | | | | | | |
| | Grant Cove, West Coast of Gravina Island: 55°20'x131°46' (Not Mapped) | Clarence Straits | | X | | | | | | | | NO | | | | | | | | | |
| | Tsa Cove; Upper George Inlet (Not Mapped) | George Inlet | | | | | X | | | | | NO | | | | | | | | | |
| | Leask Cove; Upper George Inlet: 55°51'x131°25' (Not Mapped) | George Inlet | | | | | X | | | | | NO | | | | | | | | | |
| | Ice House Cove (Not Mapped) | George Inlet | X | X | | X | X | | Fishing | | | YES | | X | | Salmon | | X | | | Old Boiling Station |
| | Sweat Lodge Beach: 755,92e (Not Mapped) | 10.25 Mile STH; George Inlet | X | | | X | | X | | | | NO | X | X | | | | | | | Native Sacred Site |
| | Neets Bay (Not Mapped) | West Behm Canal | | X | | X | Dock | | Fishing | | | YES | | | | SSRAA, Salmon | | | | Bears | |
| | Loring (Not Mapped) | Clover Passage Naha Bay | | | | | Dock | | | | | YES | | | | | | | | | Cannery Town, Graves |
| | Guard Island (Not Mapped) | Clarence Strait Tongass Narrow Clover Passage | | X | | X | X | X | | | X | YES | X | | | | | | | | Old Light House |


Clover Pass Scenic Area
Naha Bay and River System
Orton Ranch
Public Dock
Black Bear Observation Point
Moser Bay Estuary
Lunch Falls Loop Trail
Lunch Creek Trail
Boating and Sport Fishing
Kayaking and Boating
Camping and Beach Combing
Betton Island Marine Park
Marinas
REVILLAGIGEDO ISLAND
Coast Guard Beach Trail
Whipple Creek Area Hiking, RTVs and Berry Picking
Camping, Hiking, Fishing
Ward Lake Rec. Area
Ward Creek Trail
Totem Bight State Park
Totem Pole Park and Clan House
Perseverance Trail
Downtown Historic Area and Shopping
Ketchikan
Lewis Creek
Minerva St. Trail
Achilles St. Trail
Deer Mt. Trail
Bear, Fish and Bird Viewing, Sport Fishing
Proposed Coastal Trail
Upper Grant Cove Old Growth Reserve and Roadless Area
Bostwick Lake
Saxman
Saxman Totem Park
Rotary Beach
GRAVINA ISLAND
Totem Pole Park, Clan House and Carving Shed
Fishing, Whale Watching, Scuba Diving, Boat Launch
Dall Ridge Trail
Guard Islands
Tatoosh Islands
Clarence Strait
Behm Canal
Carroll Inlet
Index Map of Areas Used for Recreation and Coastal Access, 2005
Map Figure 3.1
Prepared by Resource Data Inc. for the Ketchikan Gateway Borough Dept. of Planning and Community Development

town recreation opportunities may expect more of a mix of uses and improvements. It will also be important to consider the impacts of new development and subdivisions upon existing recreation areas and coastal access so as not to compromise recreation values important to locals and the visitor economy. Road construction can open new areas to recreation uses and have a positive, direct impact; however, development of new roaded recreation will need to carefully consider the potential impacts upon existing remote recreation areas and experiences including personal use and sport harvest of fish and wildlife.

### Visitor Industry

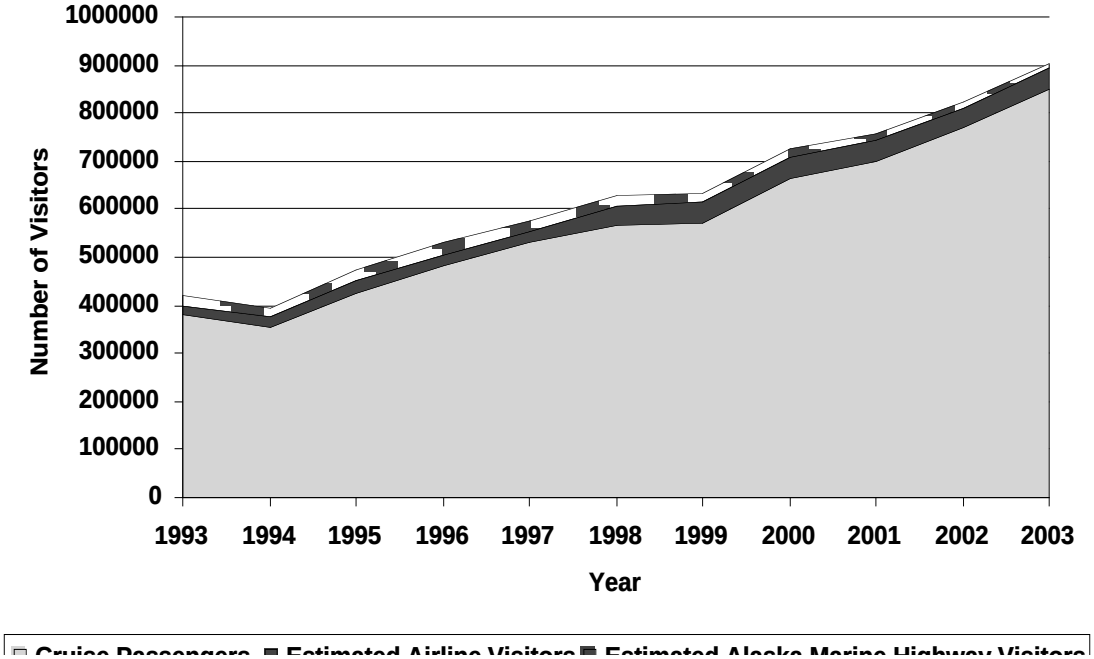
The Ketchikan area, like many areas in Alaska, has benefited from the substantial growth in the visitor industry. However, along with the benefits of this growth comes an increased demand for coastal access, recreation resources and possible competition for these resources between visitors and local users.

*Figure 4.4* depicts the growth of the number of summer visitors to the Ketchikan area from 1988 to 1998. Over a 10-year period, there was a 137% increase in summer visitors to Ketchikan, with the cruise industry playing a major role in this growth. Most tourists and recreational visitors to the area are likely to take advantage of the fishing opportunities, outdoor recreation, cultural heritage, and scenery. While the cruise industry has been growing at a steady pace, the number of independent visitors to Ketchikan has not increased substantially in recent years. However, expanded marketing by AMHS and daily ferry service between Ketchikan and other communities may increase the number of independent visitors.

The specific present and anticipated tourism needs include:

- Development of facilities for the independent traveler including RV parks, services, and attractions
- Enhanced public access to, from, and along the shoreline
- Upgrades to Ketchikan International Airport
- Expanded and remodeled harbor facilities
- Upgraded facilities for Ketchikan Yacht Club at Thomas Basin
- Development of Performing Arts Center
- Completion and expansion of Trails Ketchikan initiative
- Maintenance of community's historic character
- Creation of new visitor destinations including an aquarium, museum, ski area, and other facilities.
- Facilitation of continued historic preservation and pedestrian improvements (e.g., the downtown waterfront promenade) and other community design features.
- Development of additional dispersed and year-round roaded recreation opportunities.
- Bridge access to Gravina Island
- Construction of Shelter Cove Road

*Figure 4.4 Estimated Number of Visitors to Ketchikan, 1993-2003*




*Sources: Ketchikan Visitors Bureau, 2005*

The Existing Conditions Report of the Demographics and Socioeconomics Analysis for Ketchikan 2020 and the Gravina Access Project (HDR 2000) provides an additional detailed analysis of the economy of the Ketchikan Gateway Borough with respect to tourism in the area.

Tourism in the area has a positive, direct impact on the economy. Ketchikan visitors contribute to the economy through spending at local shops, restaurants, outfitters, and tour operators. Tourism businesses also generate spending in the community for supplies and services. Total visitor-related retail sales in 1998 were approximately $37 million. Popular fishing locations or hiking trails, however, may be adversely affected by overuse, which could lead to competition between locals and visitors. Also, tourists are attracted to areas where wildlife is known to frequent, which also tend to be sensitive habitat sites. Tour boats, flight-seeing, and hikers partaking in wildlife viewing may unintentionally disturb wildlife habitats and nesting grounds.

Visitors make an important contribution to Ketchikan's economy. Maintaining appealing areas for tourists to visit while avoiding sensitive habitats and popular local hunting, fishing, and subsistence use areas is important to the long-term support of the economy and avoidance of conflicts with other users. Some visitors may be sensitive to development that would detract from the natural setting of Ketchikan. Properly locating and designing development is important to maintaining and growing all sectors of the economy.

### Sport fishing

The total number of charter fishing vessels registered annually in Southeast Alaska has increased over the past 12 years to approximately 1,224 vessels in 1999. Forty-five percent of the registered charter vessels work out of Ketchikan (ADF&G 1999) and provide a significant destination activity for visitors. While sport fishing occurs in most of the marine waters of the

area, many sport fishers prefer waters outside the immediate Ketchikan area (Ketchikan Gateway Borough 1994). In Southeast Alaska, sport anglers prefer to fish for king salmon, and 66 percent of the charter fishing vessels target halibut once king salmon become limited. After annual limits of Chinook and halibut are reached and when other salmon species are not available, sport fishing charters pursue other bottomfish such as lingcod and rockfish (ADF&G 1999) (*Table 4.5*).

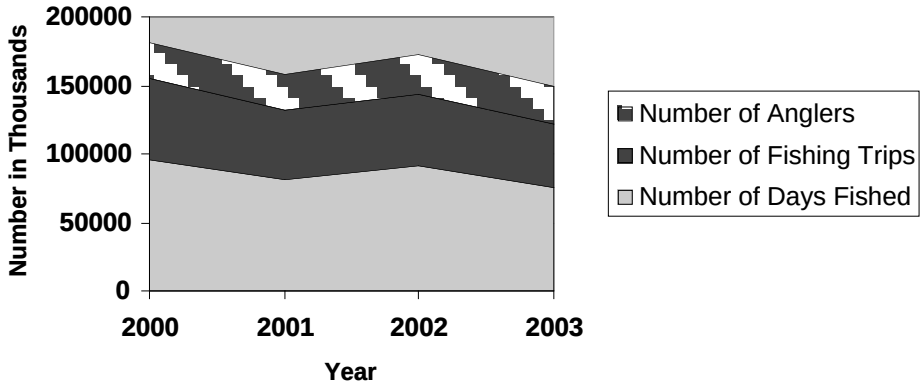
**Table 4.5 Best Saltwater and Freshwater Fishing Times in Southern Southeast Alaska**

| Species | Saltwater | | Freshwater | |
|---|---|---|---|---|
| | Availability | Peak | Availability | Peak |
| King salmon | year round | May–mid July | mid May–Aug. | mid June–mid Aug. |
| Sockeye salmon | June–Aug. | June–Aug. | June–Aug. | July–Aug. |
| Coho salmon | June–mid Oct. | mid July–Sept. | mid June–mid Nov. | mid Aug.–Sept. |
| Pink salmon | June–Aug. | July–mid Aug. | July thru mid Oct. | July–Sept. |
| Chum salmon | June–mid Sept. | mid July–Aug. | July thru Oct. | August |
| Dolly varden | year round | June–mid July | year round | July–Oct. |
| Cutthroat trout | May–Sept. | June | year round | May and June |
| Halibut | February–Dec. | mid June–mid Sept. | | |
| Rockfish | mid Jan.–Dec. | June–mid Sept. | | |
| Lingcod | year round | year round | | |
| Brook trout | | | year round | July–Sept. |
| Grayling | | | year round | year round |
| Kokanee | | | year round | May, Jun, Oct. & Nov. |
| Steelhead trout | | | year round except July | April, May, Nov. & Dec. |

Source: ADF&G Division of Sport Fisheries Southeast Alaska Sport Fishing
http://www.state.ak.us/local/akpages/FISH.GAME/sportf/region1/r1home.htm

Sportfishing in the Ketchikan area is an extremely popular recreational activity for tourists and local residents. Figure 4.5 shows the number of sportfishing trips and Figure 4.6 shows the number of sportfishing days during the period from 2000 through 2003.

*Figure 4.6 Ketchikan Area Sportfishing Trips, 2000-2003*




Source: ADF&G, 2005. Note: Ketchikan area incluldes all surrounding Alaska waters, including drainages, from Portland Inlet, but not including, Ernest Sound, including Duke, Annette, and Gravina Islands.

# Energy Facilities

## Resource Inventory

### Energy Inventory

Electrical power supply in the region is generated by hydroelectric power facilities at Swan Lake, Tyee Lake, Terror Lake, and Solomon Gulch, which are owned by a consortium of public and private hydroelectric producers known as the Four Dam Pool. However, local power is generated only by facilities at Swan Lake, Beaver Falls, Silvis Lake, Upper Silvis Lake, and Ketchikan Lakes. These facilities, except for Swan Lake, are owned by the City of Ketchikan. The Swan Lake facility, which sells electricity to the City, operates near its capacity to generate power.

Ketchikan Public Utilities (KPU) provides electricity to the Ketchikan area, including the City of Ketchikan, the City of Saxman, Gravina Island, and Pennock Island. The annual load (2001) for the community was 166,000,000 kilowatts. KPU's city-owned hydro facilities have a maximum output of 80,000,000 kilowatts. Swan Lake can produce 81,000,000 kilowatts. This output, however, is dependent upon adequate precipitation. As backup, the city has 80,000,000 kilowatts in diesel generation available by burning fuel that is purchased in bulk and barged to Ketchikan. KPU's historical loads grew from 110,952,000 kWh per year in 1984 to approximately 162,000,000 kWh per year in 1995, an average annual growth of 3.5 percent, based on actual generation data from KPU. KPU is an isolated electrical network with no interconnection to any other utility or transmission system outside their service territory, except for the Alaska Energy Authority's (AEA) Swan Lake Hydroelectric Project. As an alternative to diesel generation, KPU is pursuing construction of a transmission line from Ketchikan to the Petersburg/Wrangell area, i.e., the Swan Lake-Lake Tyee Intertie, to convey additional electrical power from hydroelectric power facilities to the area. The right-of-way for the Swan Lake Powerline was established by United States Forest Service Special Use Permit KET39. The Lake Tyee Hydroelectric Project is located about 60 miles north of Ketchikan.

The City of Saxman has proposed construction, operation, and maintenance of a hydroelectric project on Upper Mahoney Lake and Upper Mahoney Creek near Ketchikan. The project would be sited on private land selected by the Cape Fox Corporation, under the Alaska Native Claims Settlement Act and on approximately 114 acres of National Forest land in the Tongass National Forest.

## Resource Analysis

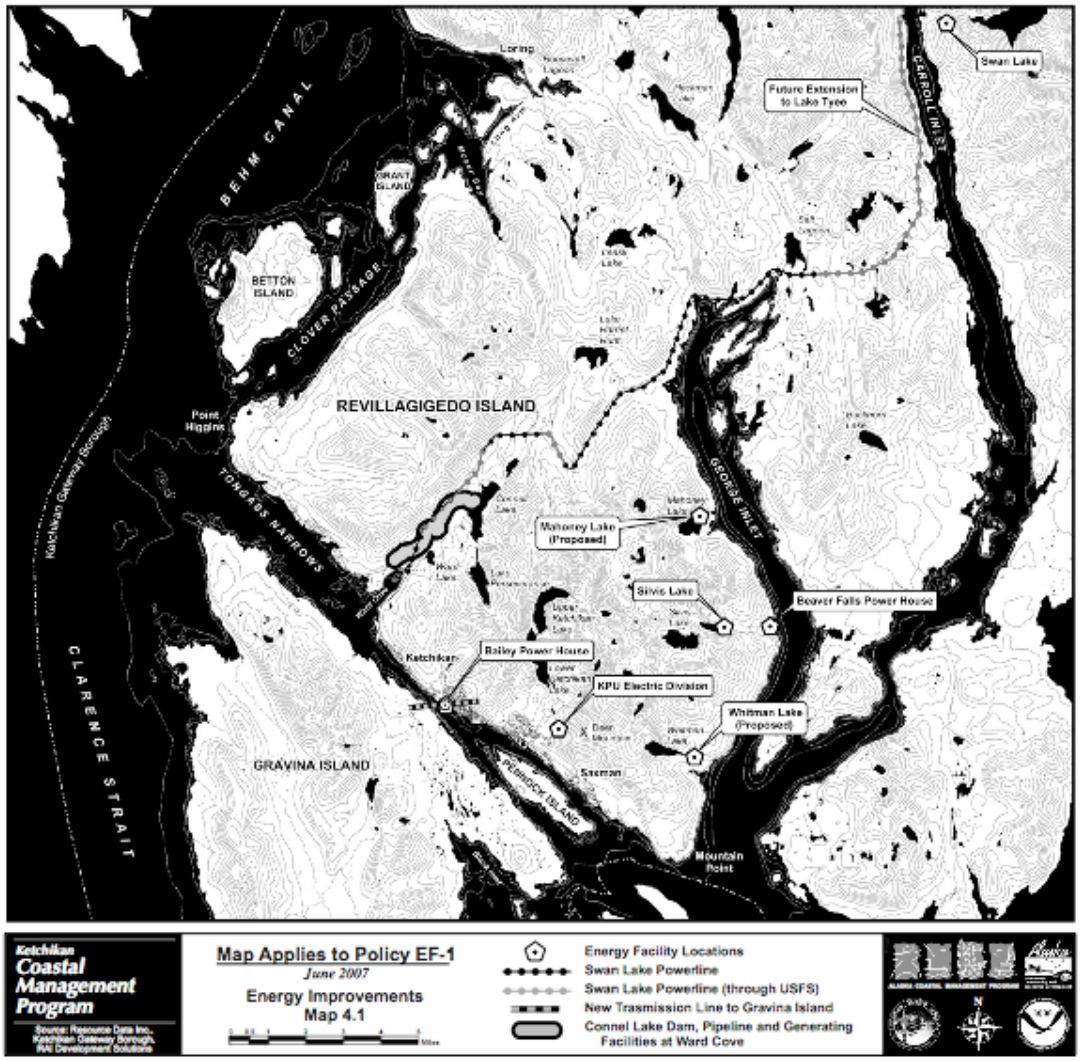
*Present and Anticipated Needs.*

The specific present and anticipated facility and service needs include:

- Swan Lake-Tyee hydroelectric intertie
- Mahoney Lake hydroelectric facilities
- Whitman Lake hydroelectric facilities
- Connell Lake hydroelectric facilities
- Metlakatla transmission line
- Develop the Connell Lake dam and pipeline into an industrial water and power source.

*Map Figure 4.1* illustrates those areas designated for construction of energy improvements.

These areas are well known and documented in state and local planning documents. Exhaustive consultation occurred during these state and local planning processes. Additionally, consultation with state agencies occurred concurrently with coastal plan development during the interagency workshops in Anchorage in November 2004 and 2005 and during the review of the various public hearing drafts since 2004.




*Direct and Indirect Impacts*. Dams and hydroelectric facilities, if not properly designed, can impact streams and lakes by changing flow dynamics. Adjacent upland and/or riparian habitat is sometimes flooded to serve as a reservoir. Impacts to fish and wildlife from loss of habitat can occur if appropriate measures to protect the resources are not taken. Diesel power generation burns fossil fuels and can result in air pollution. Without proper storage and handling, fuel spills, which could impact surface or groundwater, are possible.

*Suitability and Sensitivity*. Stream crossings and wetland areas are potentially sensitive to utility line crossings. Linear features such as roads, trails, or other utilities are generally more suitable locations. Co-locating facilities can often consolidate and thereby reduce impacts. Placing the utilities in more sensitive areas, however, may present the only practical alternative due to

surrounding topography and natural features. Anadromous streams and lakes or other productive habitats can be particularly sensitive to dams and hydroelectric facilities.

*Conflicts Among Uses and Activities*. Power generation facilities are considered industrial uses. These uses often produce noxious odors, noise, and large unsightly structures. Compatibility with existing and future land uses and adjacent use of resources by others should be considered when locating these facilities.

# Transportation

## Resource Inventory

### Road Transportation

*Tongass Highway (a.k.a. State Highway 29) is approximately 30 miles in length and provides arterial access to all developed areas of the Borough. Tongass Avenue, as it is known inside the city, runs along the waterfront and has several additional name changes as it winds through town. At the city limit to the north it becomes North Tongass Highway, ending at Settlers' Cove State Park, and to the south it is South Tongass Highway, ending at Beaver Falls Powerhouse. The entire length of Tongass Avenue is maintained by the DOT&PF. The volume to capacity ratio and levels of service in the downtown area often fall below acceptable standards in the downtown areas during the period of May to September when visitor traffic is heaviest. Pedestrian traffic downtown is also especially heavy during the summer visitor season and exhibits a tendency to overwhelm certain locations and intersections.*

As early as 1976, a local traffic study determined that the number of vehicles traveling Tongass Avenue exceeded the road's capacity by almost 80 percent and traffic congestion was a prevailing problem. That same study identified the need for an additional 900 parking spaces in the downtown. Over the intervening time the community has struggled to deal with these needs. Today, traffic congestion and parking problems persist. Because Tongass Avenue is the only route that traverses the city, it experiences heavy use and frequent traffic delays. The road was widened in the 1950s to four lanes, two travel lanes in each direction; however, the outer lanes are used for on-street parking. The state completed the Third Avenue By-Pass in the 2004 which also relieves a portion of the traffic volume in key areas. North Tongass Highway has a higher traffic volume compared to South Tongass Highway because more residential development and larger businesses are located along the northern corridor.

Several alternatives have been proposed to relieve traffic problems and congestion in downtown and Bar Harbor areas. In March 1995, the DOT&PF prepared an Environmental Assessment and Draft Section 4(f) Evaluation of proposed Tongass Avenue improvements (DOT&PF 1995). These improvements included construction of the Third Avenue By-Pass (completed) and reconstruction of Tongass Avenue (underway) Some additional satellite parking spaces were also constructed as a part of this project. Other suggestions to improve the road system conditions are:

- Construction of alternative roads and routes (such as the Secondary By-Pass)
- Create bike paths and pedestrian walkways
- Improve intersections and traffic control on Tongass Avenue
- Remove on-street parking during peak traffic
- Widen Tongass Avenue to four lanes between Third Avenue and north city limits
- Determine optimum connection with future bridge to Gravina Island and airport

(Official Streets and Highway Plan- Ketchikan Gateway Borough 1995)

Tongass Highway north and south of the city has a long history of deferred maintenance and poor design standards. There are currently several pending projects in the Statewide Transportation Improvement Plan that would realign, repave, and improve operation of the roadway for vehicles, bicycles, and pedestrians.

Geographic constraints, lack of privately owned land, and poor access limit the base of developable land to a narrow strip along Tongass Narrows on Revillagigedo Island. Within this

narrow strip, suitable vacant land for expansion is limited. As a result, improving access to Gravina Island has been a planning priority to increase alternative locations especially for industrial/commercial development. The community's planning documents indicate that a "hard link" is preferable. The history of this project follows:

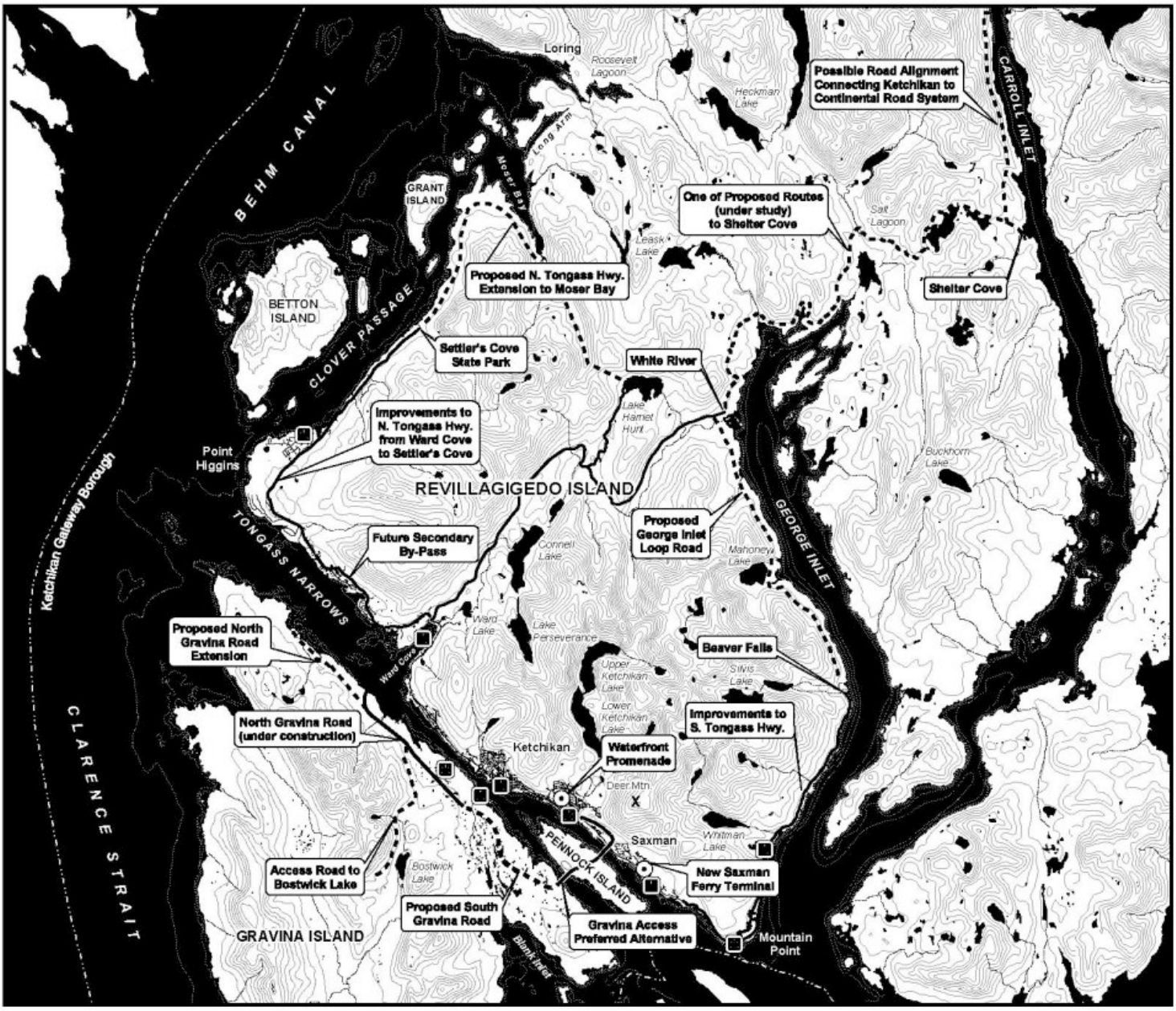
- In 1973, the Ketchikan International Airport is constructed and shuttle ferry service begins.
- In 1973, the State of Alaska examined eight proposed bridge crossings.
- In 1981, the Ketchikan Gateway Borough examined bridge and underwater tube crossing alternatives.
- In 1984, Tippetts-Abbett-McCarthy-Stratton provided a cost analysis of proposed bridge, tube, and ferry crossings.
- In 1988, the Ketchikan Gateway Borough passed Resolution 794 supporting a "hard link" crossing and the preparation of an environmental impact statement (EIS).
- In 1989, the Ketchikan Gateway Borough studied road routes on Pennock and Gravina Islands to the airport.
- In 1991, the Alaska Legislature authorized funding for the Ketchikan "Hard Link" EIS.
- In 1994, the DOT&PF prepared an in-house draft EIS of ferry, bridge, and tunnel crossing options.
- In 1998 the Federal Transportation Equity Act for the 21st Century (TEA-21) allocated funds specifically for this project. Additional funding will be required to begin construction of a selected access alternative.
- In 2004, an approved Environmental Impact Statement selected a bridge alternative as the Preferred Alternative for improving access. See Map Figure

Outside of the developed Ketchikan area, a number of other roads (namely access across Cleveland Peninsula to Tyee and the Shelter Cove Road) have been proposed. These roads would improve access to the community and open additional lands desirable for residential, recreational, and commercial development.

The Shelter Cove Road would extend Ward Lake Road to a network of forest roads in and around Shelter Cove. The road would either proceed in a northeasterly direction from near Lake Harriet Hunt or result from an extension of the White River Road. Various corridor alternatives have been proposed. The road would improve access to the national forest for local and visitor recreation as well as provide access to state, federal, and private lands suitable for remote residential development, timber harvest, and other activities. An extension of the Shelter Cove road may in the future provide access off of Revillagigedo Island to the Canadian road system via the Cleveland Peninsula and the Bradfield Canal. The City of Wrangell, the State Legislature, and U.S. Congress have longed talked about the Bradfield Canal road, which would provide access from the Ketchikan Gateway Borough to Canada and the lower 48. *Map Figure 6.1* illustrates those areas suitable for future transportation development and expansion.

### Marine Transportation

This section summarizes the results of the inventory of the marine navigation system in Tongass Narrows. A detailed description of the system is available in the Marine Navigation Conditions Summary Technical Memorandum prepared for the Gravina Access Project (The Glosten Associates 1999).




Transportation Development and Expansion 2005

Map Figure 6.1

0 0.5 1 2 3 4 5 Miles

Prepared by Resource Data Inc. for the Ketchikan Gateway Borough Dept. of Planning and Community Development

Harbor and Marine Access Improvements

Other Priority Locations

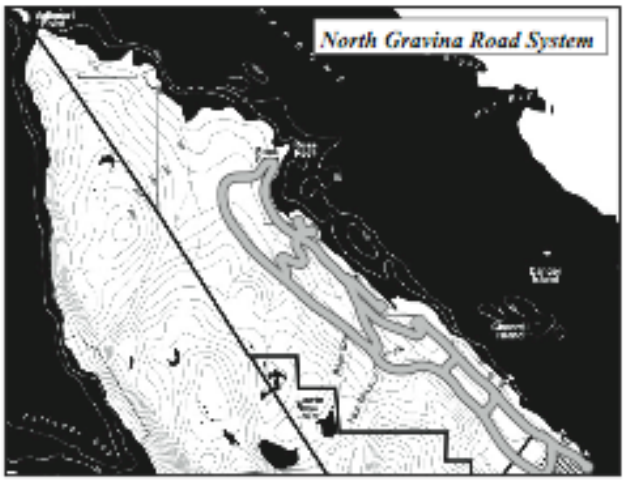
Possible Future Roads

Existing Roads

*Transportation & Utilities Continued*

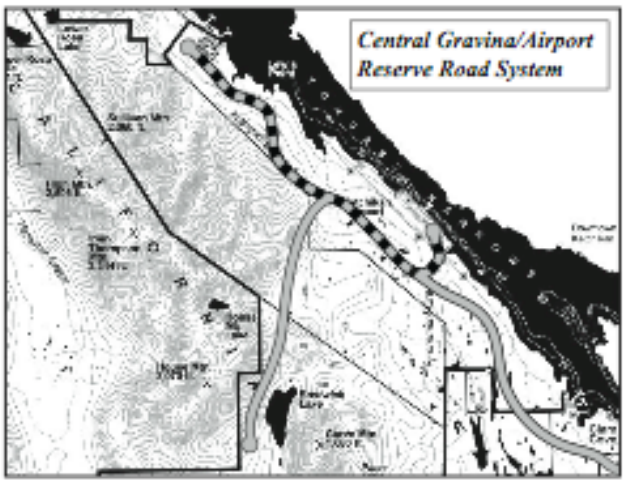

### 6.2 North Gravina Road System

**Description:** Approximately 3.9 mile road now under construction from airport terminal to Pacific Log & Lumber; a 1.6 mile road extension now being permitted; and future road segments totaling 5.2 miles.
**Access:** Airport ferry and future bridge.
**Primary Uses:** 180-acre industrial park, 400-boat marina, 221 residential and commercial sites, beaches, open space.
**Community Interests:** Meets important needs for moderately-sloped industrial lands with access to saltwater and airport, accesses important Borough lands for community residential and commercial expansion, secures important (and rare) marina site.
**Protection Status:** Nearly all road corridors are on Borough land (exception: private parcel at Rock Point).
**Notes/Comments:** The Borough is seeking diverse financing sources including federal highway funds, area property owners (LIDs), and direct Borough investment.



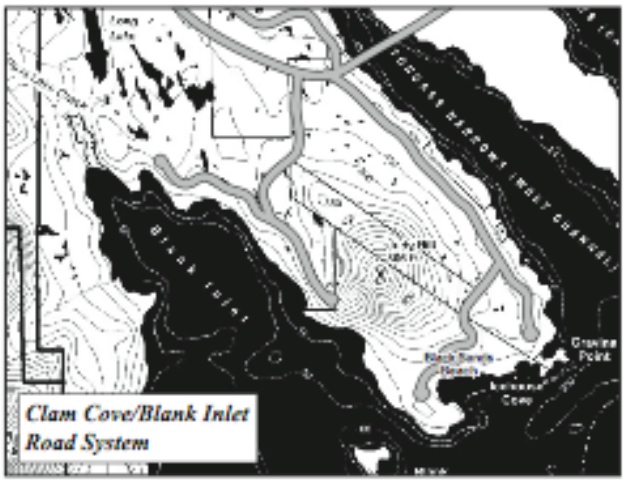

### 6.3 Central Gravina/Airport Reserve Road System

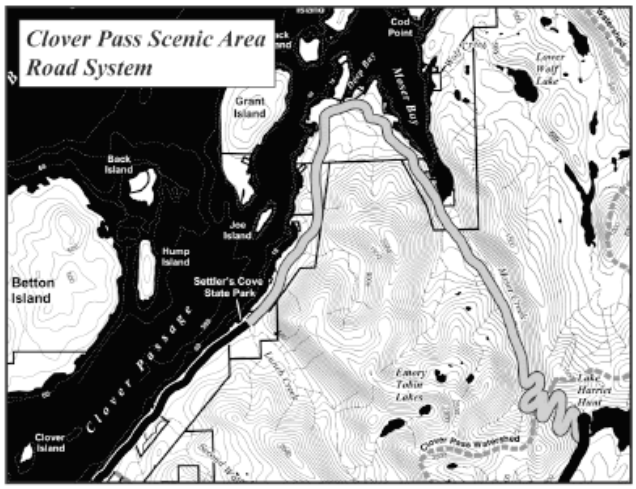
**Description:** Approx. 3.9 mile road under construction from airport terminal to Pacific Log & Lumber; a 2.5+ mile future road to Bostwick Lake; a 1.75 mile future road to the south end of the Airport Reserve.
**Access:** Airport ferry and future bridge.
**Primary Uses:** 120-acre industrial park, timber harvests, recreation, airport expansion, and trails.
**Community Interests:** Meets important needs for moderately-sloped industrial lands requiring upland acreage with access to saltwater and airport, accesses significant commercial timber stands, and accesses year-round recreation areas of statewide significance.
**Protection Status:** The road corridors are on the Airport Reserve, Mental Health Trust lands and State Dept of Natural Resources lands (ROWs now being established).
**Notes/Comments:** The USFS and State DNR are to finance the Bostwick Lake Road for timber harvest purposes initially and for permanent public use ultimately.

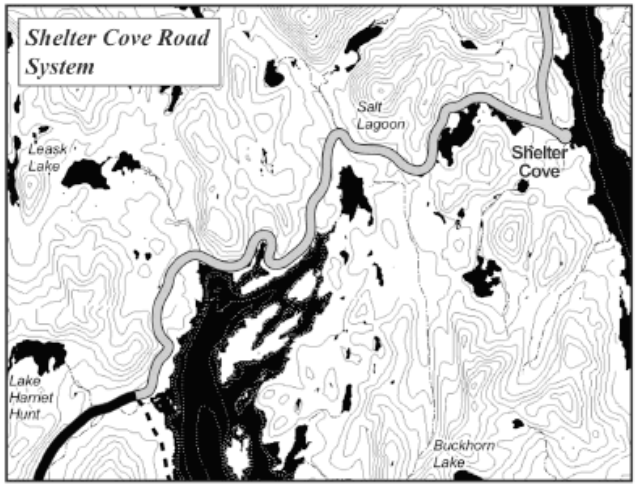


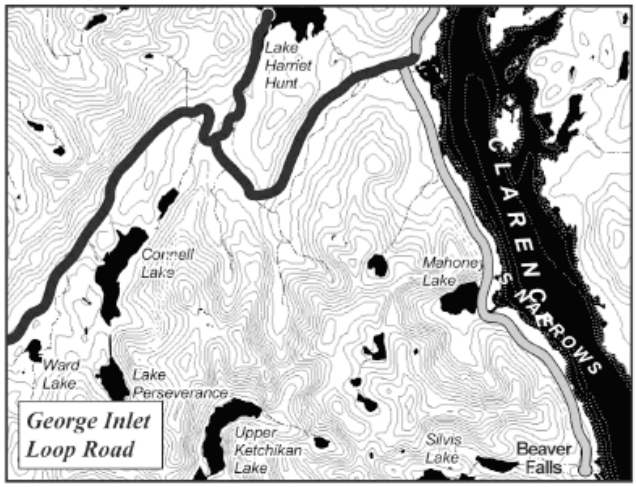

### 6.4 Clam Cove/Blank Inlet Road System

**Description:** A 3.75 mile future road from Pennock Island bridgehead to the south airport runway area); a 1.25 mile collector road through Clam Cove; a 2.25 mile shoreline road south of Clam Cove; a 3 mile road serving Blank Inlet; and future road segments totaling 1.5 miles.
**Access:** Airport ferry, new road from airport, future bridge.
**Primary Uses:** 120-acre industrial park, growth center at Clam Cove, 282 recreational homesites or residences, commercial resort opportunities, recreation areas.
**Community Interests:** Accesses important Borough lands for community residential and recreational expansion, serves as primary corridor from City and Pennock bridge, and accesses year-round recreation areas.
**Protection Status:** The road corridors are on Borough/ private lands, ROWs established only on bridge corridor.
**Notes/Comments:** A conceptual plan for Clam Cove development has been approved but further studies are needed to determine street patterns within the community.



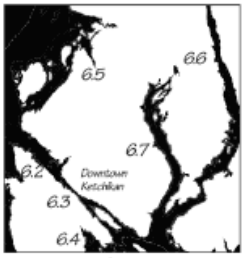



## 6.5 Clover Pass Scenic Area Road System

**Description:** A road to be built in segments as feasible from Lunch Creek bridge to Moser Bay (3.9 miles) and on to join existing roads at Lake Harriet Hunt (6.5 miles).
**Access:** The terminus of North Tongass Highway.
**Primary Uses:** Proposed residential subdivisions along N Tongass Highway corridor on primarily Borough lands; marine commercial and recreation uses; private res/rec homesites at Deep Bay/Moser Bay, trails and park areas.
**Community Interests:** Accesses Borough lands for community residential/recreational expansion, provides opportunity for boat ramps to Clover Pass waters.
**Protection Status:** Most corridors on Borough lands, with a small section at Settler's Cove State Park and on federal lands from Moser Creek estuary to Lake Harriet Hunt. ROWs have not been established.
**Notes/Comments:** A public hearing draft plan for Clover Pass area (including the proposed road network) has been prepared but not yet approved (public process underway).



*Locator Key for Maps*

## 6.6 Shelter Cove Road System

**Description:** A road to be built from the White River area along Upper George Inlet to connect to existing USFS road network in Shelter Cove area (approx. 10 miles) and northward to the Bradfield Canal.
**Access:** Revillagigedo Highway
**Primary Uses:** Residential and remote recreation subdivisions along Upper George Inlet, Salt Lagoon estuary recreation area, proposed recreation homesite subdivisions on UA and DNR lands, recreation use on Upper George Inlet and Carroll Inlet waters.
**Community Interests:** Accesses existing remote cabins, new recreation opportunities for locals and visitors, and sites for community residential and recreation.
**Protection Status:** The road corridor crosses lands owned by Cape Fox Corporation, DNR, Mental Health Trust, U of A, and USFS. There are no Borough-owned lands along the corridor. ROWs are not yet established.
**Notes/Comments:** Road corridors have been under study.

## 6.7 George Inlet Loop Road

**Description:** A road to be built north from the Beaver Falls area along the George Inlet coastline to the White River area (approx. 7.5 miles).
**Access:** S. Tongass Highway and Revillagigedo Highway
**Primary Uses:** Marine and land-based recreation along George Inlet, residential homesites.
**Community Interests:** Provides loop road that would be popular means of accessing recreation opportunities along the entire loop corridor. Provides more direct access for south end residents to Upper George Inlet attractions. Opens land for residential uses.
**Protection Status:** The road corridor crosses lands owned primarily by Cape Fox Corporation. ROW not established.
**Notes/Comments:** Corridor use limitations would have to be negotiated with CFC.

***Alaska Marine Highway System and Inter-Island Ferry Authority.*** The Alaska Marine Highway System (AMHS) operates five mainline and two feeder vehicle/passenger ferries in Southeast Alaska, providing a major source of transportation in Southeast Alaska and Ketchikan.

The Ketchikan Shipyard is located at the AMHS terminal. Ferry service links Ketchikan to outside communities, including Bellingham, Washington. Ketchikan is the midpoint between Bellingham and Skagway for the mainline vessels.

The Ketchikan-Bellingham run operates at capacity during the summer. The AMHS made 16 northbound and 16 southbound trips each week in Ketchikan during the summer of 1990. A new ferry was added to the system in 1998.

The AMHS mainline vessels are the *Columbia, Kennicott, Malaspina, Matanuska,* and *Taku.* Currently the *Columbia, Kennicott, Matanuska* and *Taku* routinely call at Ketchikan. Two smaller vessels transport passengers and vehicles between the smaller communities. The feeder vessels operating in Southeast Alaska are the *Aurora* and *Le Conte*. Under current schedules the *Aurora* routinely calls at Ketchikan. In March 1999, the DOT&PF approved a new regional transportation master plan for Southeast Alaska. Known as the "Southeast Alaska Transportation Plan" (SATP), this new plan will result in significant changes to the way ferry service is delivered in the Southeast Alaska region, and consequently will alter the future character of the AMHS vessels calling at Ketchikan.

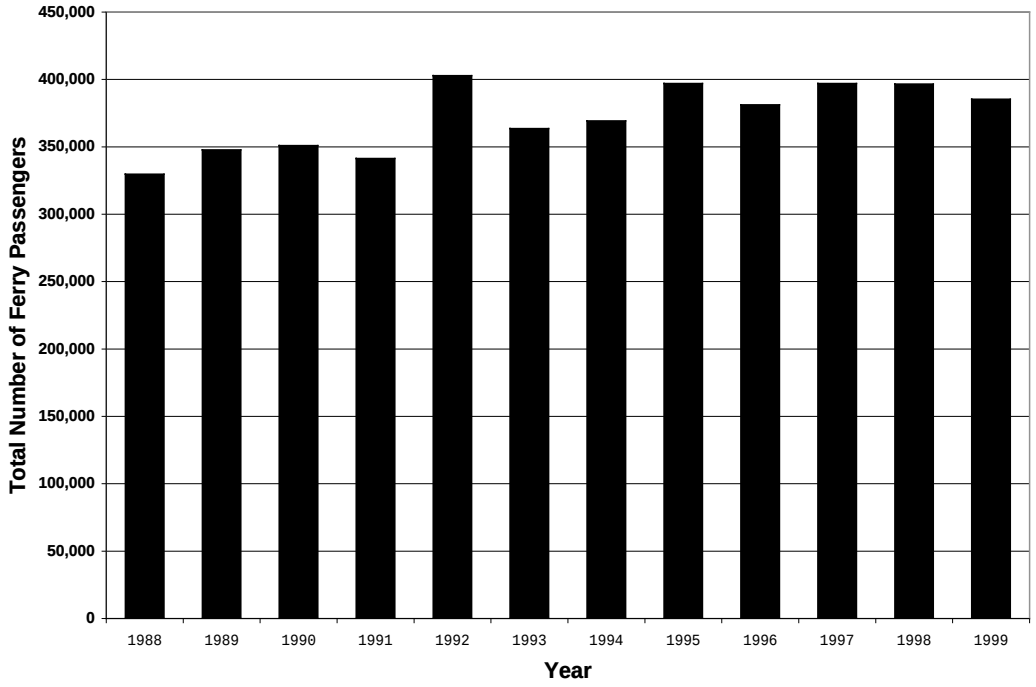
The Inter-Island Ferry Authority (IFA) has recently put a new ferry, the Prince of Wales, into daily service between Ketchikan and Hollis. The vessel is a conventional displacement monohull vehicle and passenger ferry, similar to (though somewhat smaller than) the existing AMHS vessels *Aurora* and *Le Conte*. The vessel is docked at a new terminal near the existing AMHS terminal.

***Airport Ferry.*** The Borough operates ferries to provide access to Ketchikan International Airport. During the winter, the Borough operates one ferry every half–hour and, during the summer, two ferries provide access every fifteen minutes. The capacity during the summer months is at its limits and a new ferry with additional capacity has been recently brought on-line.

The number of ferry passengers at Ketchikan International Airport increased by 16.9 percent, from 329,637 passengers in 1988 to 385,332 passengers in 1999, a considerably smaller increase than for airport passengers (The Glosten Associates 1999). Total ferry passengers increased, by 18.0 percent from 1991 to 1992, and decreased, by 9.7 percent from 1992 until 1993. *Figure 6.2* illustrates the number of ferry passengers from 1988 through 1999.

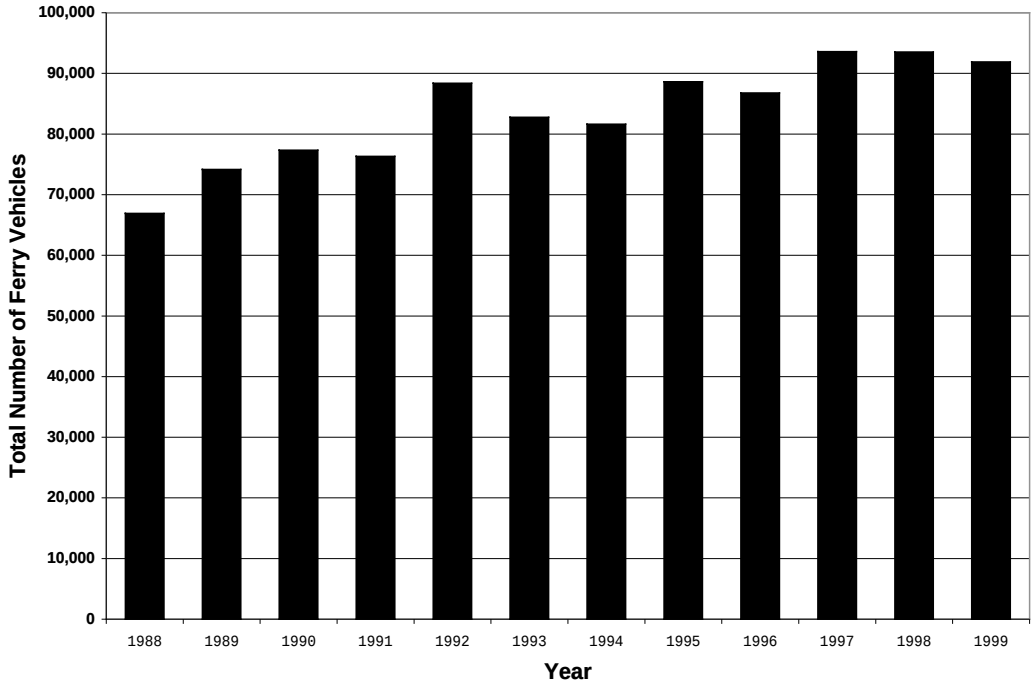
*Figure 6.3* demonstrates the number of vehicles that used the Ketchikan airport ferry from 1988 until 1999. This number increased from 66,901 vehicles in 1988 to 91,884 vehicles in 1999, a 37.3 percent change over the time period, the largest increase of the passenger and traffic volumes examined. The number of ferry vehicles increased, by 15.8 percent from 1991 to 1992.

*Figure 6.2 Ketchikan International Airport Ferry Passengers, 1988-1999*




Source: Ketchikan International Airport, 2000.

*Figure 6.3 Vehicle Usage of Ketchikan International Airport Ferry, 1988-1999*




Source: Ketchikan International Airport, 2000.

***Cruise Ships.*** Cruise ships are an important component of seasonal marine traffic in Ketchikan. During the summer months, May through September, three to five cruise ships are often in town on the same day. The Berth 1 facility and Tongass Narrows experience congestion from the cruise vessels. During the times of heavy traffic, the ships must anchor in deeper water and lighter passengers to the City floats. According to the Marine Navigation Conditions Summary Technical Memorandum prepared for the Gravina Access Project (The Glosten Associates 1999), data from the past decade indicates that the number of cruise ship stops at Ketchikan has increased by 18.23 stops per year, and the number of cruise ship passengers calling by 36,084 passengers per year (numbers based on mean linear trends). Continued growth in cruise ship traffic will increase both the demands on current city dock facilities and the congestion in Tongass Narrows. During the planning period, it is expected that cruise ship visitor traffic could nearly double from 700,000 passengers in 2003 to 1.4 million passengers in 2015 according to City of Ketchikan planning studies. To capture this growth, it is likely that the community will need to expand mooring facili6ties, docks, utilities, sidewalks, parking and bus staging areas and transportation centers.

***Commercial Vessels.*** Commercial vessels in Tongass Narrows include tugs and barges, commercial fishing boats, charter boats, personal watercraft, and small capacity fishing and sightseeing operations. The most significant vessel congestion occurs during the fishing and recreational season, typically while loading at floats and at fueling facilities.

***Moorage.*** Many fishing vessels stop at local canneries in Ketchikan. Waterfront transient moorage facilities are in demand for crabbers, trawlers, and fish packers that need slips in the 60 to 120-foot ranges. There is also a long list of boat owners waiting for moorage facilities for boats greater than 25 feet in length. The City of Saxman has been considered a location for a marina in addition to expanded barge transfer facilities. Further studies by Saxman are ongoing to examine all the options for adjacent waterfront uses. The U.S. Army Corps of Engineers is also studying locations for a small boat harbor. Currently, transient barges moor in Ward Cove. Additional barge moorage is also needed in more remote, less congested areas.

Besides boat moorage, harbors serve as important inter-modal transportation links in the community for the transfer of personal and commercial goods and services between the town and the road system and the outlying areas in the region. Harbor needs include better parking, larger slips, and better access between cars and boats.

***Fuel.*** Union Oil and Standard Oil are Ketchikan's two largest bulk fuel facilities. Union Oil invested in construction of dock improvements in October 1981 to accommodate larger vessels. Standard Oil cannot accommodate the larger vessels and therefore continues to rely on public wharves during periods of congestion.

***Gravina Island.*** At this time, all access to Gravina Island is provided by boat or floatplane. The airport ferry, provided by the Borough, is the only public means of transporting passengers and vehicles. No harbors providing public moorage are available on Gravina Island. Although temporary docks are available for boats and floatplanes to transfer people and goods, there is and will continue to be a need to provide better marine links between Gravina and Revilla including docks, harbors, breakwaters, and roads.

## Air Transportation

This section summarizes the results of the inventory of the aviation conditions in Tongass Narrows. A detailed description of the aviation conditions is available in the Tongass Narrows

Aviation Conditions Summary Technical Memorandum prepared for the Gravina Access Project (HDR 1999).

***Ketchikan International Airport.*** Ketchikan International Airport (KIA) is the primary air hub in southern Southeast Alaska, serving nearby communities such as Metlakatla, Klawock, and Craig. KIA is located on Gravina Island and occupies approximately 2,689 acres. The DOT&PF owns the airport and the Ketchikan Gateway Borough operates and maintains the airport through a long-term lease. The Alaska Aviation System Plan (AASP) classifies the airport as a Regional Center Airport. It serves air carrier, commercial, general aviation, cargo, and military air traffic. The Borough provides shuttle ferry service transporting passengers and vehicles to and from the airport. There is a need to expand airport facilities to meet existing safety and service demands.

Floatplane aircraft are currently accommodated on Tongass Narrows at two airport facilities towards the west end of KIA runway 11/29. One facility provides three transient docking spaces at a cost of $5/day. The other facility, according to the KIA manager, is the largest floatplane dock in Southeast Alaska, with a dock that can accommodate up to 12 Twin Otter aircraft at a time and is used for the loading and unloading of passengers and freight. Additionally, a concrete ramp is located in the area to facilitate removal of floatplanes for maintenance or storage. According to the KIA manager, floatplane operations at KIA average approximately 7,000 take-offs and landings annually, less than one-tenth of the operations conducted from the Ketchikan Harbor Seaplane Base (Chenall 1999).

More detailed information on airport transportation and proposed KIA improvements is available from the Draft KIA Master Plan Update 1999.

***Ketchikan Harbor Seaplane Base.*** The Ketchikan Harbor Seaplane base lies southeast of KIA, within Tongass and adjacent to the Ketchikan Road system. This public domain facility consists of a 10,000-foot by 1,500-foot water runway oriented northwest to southeast on the north side of the Tongass Narrows adjacent to the City of Ketchikan and numerous privately owned air taxi floatplane docking facilities. The runway is open to public floatplane use but does not provide public or transient seaplane docking facilities. According to the Federal Aviation Administration's Airport Master Record (FAA 5010), 85 percent of the average 241 operations per day from this facility are conducted by air taxi aircraft. Only 11 percent of these operations are conducted by local general aviation and 3 percent are transient. The FAA 5010 states that operations from this facility exceed 85,000 take-offs and landings annually.

***Murphy's Pullout Seaplane Base.*** Owned by the Ketchikan Gateway Borough and managed by the State of Alaska, Murphy's Pullout is located near the northern boundary of the City of Ketchikan. This facility consists of a 10,000-foot by 2,000-foot water runway oriented northeast to southwest on the north side of the Tongass Narrows in the vicinity of Ward Cove. This facility provides eight spaces for transient floatplane aircraft and a current waiting list for 10 additional planes. According to Ketchikan Flight Service Station personnel, few operations (approximately 700 take-offs and landings annually) occur at this facility (McDonald 1999).

***Peninsula Point Seaplane Base.*** The State-owned Peninsula Point Seaplane Base has been abandoned for nearly ten years and is not currently maintained for aircraft use. This facility has a concrete ramp and one hangar. Rocks and debris at the entrance to this facility impede floatplane operations. Taquan Air leases space at Peninsula Point for aircraft storage. Temsco Heliport is a privately owned heliport that operates northeast of this facility (Chenhall 1999).

## Resource Analysis

*Present and Anticipated Needs.* Ketchikan residents primarily use cars to get around town and use air and water transportation extensively to import and export freight and to carry passengers to and from the community. While the actual number of road miles is limited when compared to other communities, traffic volumes along Tongass Avenue exceed 20,000 average daily trips and are some of the highest in the state. Tongass Avenue functions both as a community main street and also provides a critical link to the shoreline for the transfer of goods and services in the community. Outside of Ketchikan, roads have been proposed which would access lands desirable for commercial, industrial, and remote residential development, and outdoor recreation.

Improved access to Gravina Island has been proposed which would open up land for development and provide improved access to the airport. The purpose and need for improved Gravina access includes:

- Provision of more reliable, efficient, convenient, and cost-effective access for vehicles, bicycles, and pedestrians to Borough lands and other developable or recreation lands on Gravina Island
- Improving to the convenience and reliability of access to KIA for passengers, airport tenants, emergency personnel and equipment, and shipment of freight
- Promotion of environmentally sound, planned long-term economic development on Gravina Island

It is expected that improved access to Gravina Island could happen during the same period that the Forest Service, State DNR, and the Borough construct a road network on the island to support a variety of activities. The proposed roads would connect the island's interior with a planned north south airport access road along the eastern shore of Gravina Island. The proposed roads could be used for management of timber resources and support other multiple public and private land uses on the island for development and recreation with the existing ferry service or with improved bridge access.

The proposed Ward Lake Extension (a.k.a. Shelter Cove Road) would connect the community to a network of forest roads in and around Shelter Cove at Carroll Inlet. This road connection would provide access to private and public lands for a variety of development and recreation opportunities. The Borough also envisions a road network that could eventually connect to the Canadian road system perhaps via Carroll Inlet, the Cleveland Peninsula and the Bradfield Canal. The Ward Lake Extension project would support identified needs for local and visitor recreation opportunities as well as the need for better access to state and private lands along the planned route.

The Inter-Island Ferry Authority (IFA) is an important component of community economic development in the Borough and the region. There may be a need for additional improvements to support its operation including parking, and other new facilities.

Ketchikan Ship and Dry-dock is evolving into an important state-wide and regional marine transportation service center. It is expected that the shipyard will expand consistent with its development plan to provide additional covered dry dock, ship repair, and ship building capacity. The expansion will include dredging, fill, and other important infrastructure important to the facility's economic success.

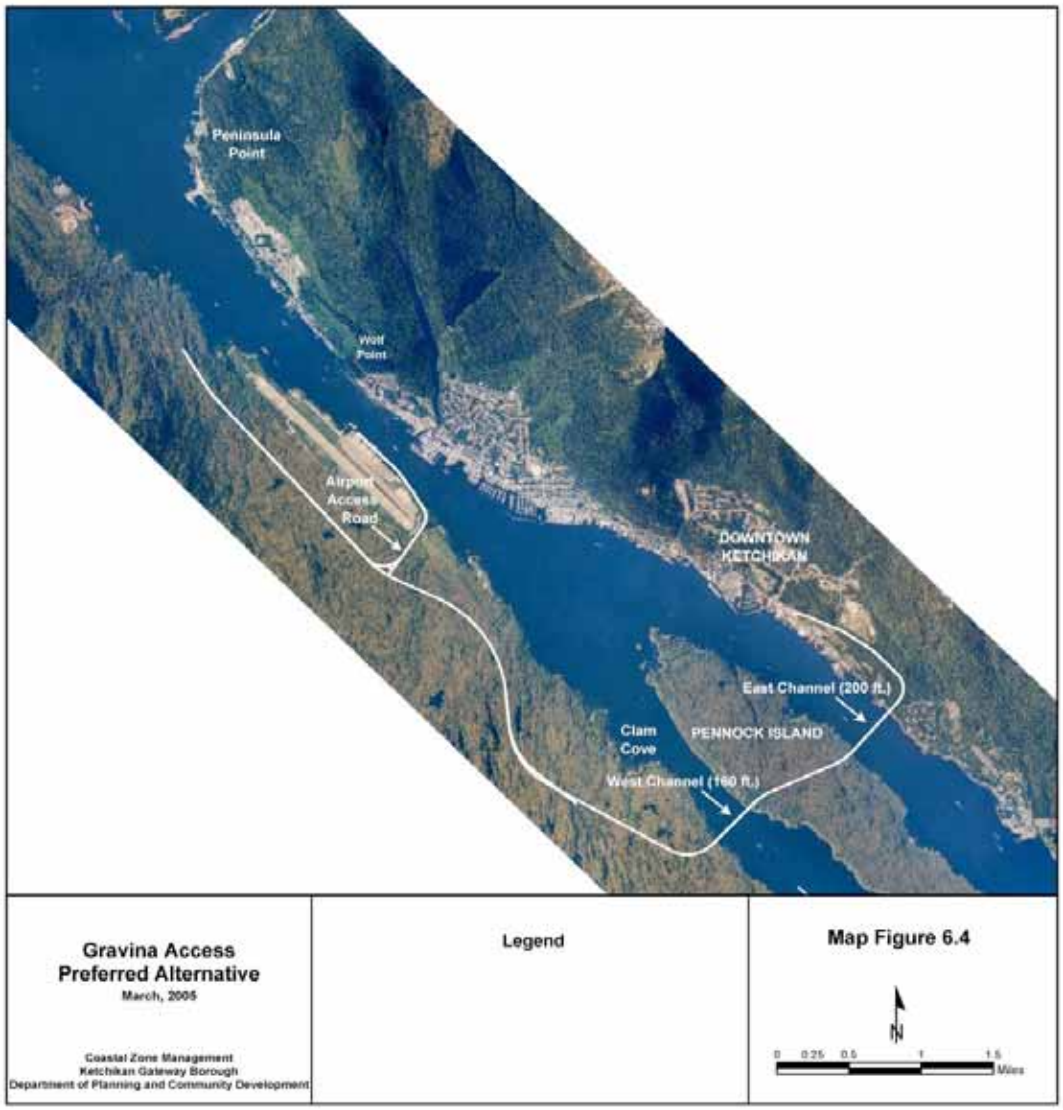
Additional floatplane facilities are needed as well as additional boat moorage facilities and marinas due to insufficient supply. The waiting list for slips accommodating boats greater than 25 feet in length has exceeded 300 vessels for years. In addition, there is a waiting list for the limited number of public and private float plane spaces available. The City of Saxman, Ward Cove, Tongass Narrows East Channel, and areas on Gravina Island have been under consideration for expansion of moorage facilities. On Gravina Island, moorage facilities are not available except at the airport. If improved access is developed, moorage sites will likely be desired on Gravina Island.

The specific present and anticipated transportation needs include:

- Construction of a transit maintenance facility
- Expansion of Airport Runway
- Completion of the downtown waterfront promenade
- Lay-up berth and mooring structures for Alaska Marine Highway System vessels
- Prince Rupert Shuttle
- Ferry service to Hyder
- Fast ferry between Ketchikan and Wrangell
- Saxman ferry terminal to accommodate the new Metlakatla ferry
- Ward Lake Road extension to Shelter Cove (Revilla Highway)
- Improvements to widen and realign South Tongass Highway from city limits to Herring Bay
- Road corridor connecting Ketchikan to the continental road system
- Roads on Gravina Island connected public and private lands to the airport
- Construction of a bridge to Gravina Island from Revilla Island
- Additional harbors, ferry docks, and dock frontage
- Public dock frontage
- Additional moorage for boats and planes
- Public/private transportation to serve Walden Point, Saxman, and a north of town Inter-Island ferry terminal
- Airport expansion and industrial development
- Implementation of Trails Ketchikan Plan
- Parking and other improvements supporting harbor facilities and waterfront development

*Direct and Indirect Impacts.* Improvements to Tongass Highway north and south of the city are necessary to improve road safety and capacity and take priority over other coastal resource uses. New road construction elsewhere in the Borough will open up land for development and recreation and may shift a portion of the population out of currently developed areas allowing room for population and economic growth. Depending on where the new access to Gravina Island is located, traffic problems may increase downtown or undesirable traffic may be introduced to other areas of the Borough. Increasing areas for outdoor recreation activities will also make available more places for residents to visit as well as attract tourists and recreation users to the Ketchikan area.

Improved access to Gravina Island, while providing land necessary for economic development, could potentially, and unavoidably, impact coastal habitats, wetlands, and estuaries, by attracting traffic and development to places where it has not previously been. As a result of improved access, Gravina Island will experience an increase in vehicle traffic and visitors, which will encourage additional road construction. Environmental impacts such as erosion, runoff, and filling of wetlands will need to be planned in relation to needed economic development and


Peninsula Point
Wolf Point
Airport Access Road
DOWNTOWN KETCHIKAN
East Channel (200 ft.)
Clam Cove
PENNOCK ISLAND
West Channel (160 ft.)
Gravina Access
Preferred Alternative
March, 2005
Coastal Zone Management
Ketchikan Gateway Borough
Department of Planning and Community Development
Legend
Map Figure 6.4
N
0 0.25 0.5 1 1.5
Miles

community expansion. Road construction to Shelter Cove will need to be planned for impacts to natural environments due to increased recreation, sport and subsistence hunting, sedimentation,

erosion, and pollutant runoff. Current primitive uses of the area, such as hunters, fishermen, and subsistence users may see an increase in competition for fish and wildlife resources. Poorly sited and planned moorage facilities could impact sensitive coastal areas on both Revilla and Gravina Island.

*Suitability and Sensitivity*. Improved access to Gravina Island will make land resources available for commercial and private development consistent with community expansion needs. The community has identified portions of Gravina Island as suitable for industrial development and other community growth needs. New industries would create jobs and would improve the economy and at the same time provide locations for people to live.

New roads can reduce wildlife and habitat values if not properly planned to avoid or minimize impacts from drainage and stream crossings. New roads also have the benefit of opening up areas for fishing and recreation. Easier access to certain locations, however, could affect subsistence and commercial harvests by disrupting animals or introducing competition for limited resources. The need to fill in wetland areas will be an unavoidable impact as a result of new road and access construction.

Additional moorage facilities will have the direct, beneficial impact of allowing commercial fishing boats easier access to land-based facilities especially during the busy summer season and provide recreational and commercial boat owners needed locations to moor their boats. Although coastal wetlands and shorelines habits can be sensitive to development, impacts to these resources are often unavoidable in the urbanized area where the need for improvements is greatest. In addition, many of the habitat areas adjacent to the road system of the urbanized area are lower value and/or isolated from higher value areas.

*Conflicts Among Uses and Activities*. Road extension and improvements and improved marine and harbor access for industrial, commercial, and residential uses might lead to conflicts with habitat areas and areas of remote subsistence, and recreation use. Within the urbanized area of the borough, however, many of these improvements are necessary to improve road safety and facility use. New access to un-roaded areas will provide new opportunities for public and private land use including recreation and timber harvest. These activities will need to be carefully planned to avoid areas with equally important coastal resources including subsistence, primitive recreation, or fish and wildlife habitat.

# Commercial Fishing and Seafood Processing

## Resource Inventory

*Like timber, and mining, commercial fishing and seafood processing has defined the Ketchikan's culture and economy for decades. Its economic role, however, like other natural resource-based products, is also subject to periods of growth and decline due to market and regulatory forces that are often beyond local control.*

*There are four seafood-processing facilities located within the City of Ketchikan. The concentration of these processing facilities in the downtown area reflects the industry's need for large quantities of water and easy access to both roads and docks. The industry also relies on access to temporary labor and nearby affordable housing when the number of employees increases significantly during the summer season. The five seafood-processing plants and their principal products are:*

- ***E.C. Phillips Processors*** – E.C. Phillips & Son, is a subsidiary of Ward's Cove Packing Co. They operate a major cannery, freezer and cold storage facility. The plant produces fresh and frozen seafood products, including salmon, halibut, sablefish, rockfish, shrimp, sea cucumbers, geoducks, salmon caviar (ikura) and herring. The plant has a freezing capacity of 300,000 pounds per day and 2.5 million pounds of storage and employs approximately 210 people at peak season.
- ***Trident Fisheries*** – Trident's Ketchikan facility is dedicated to the production of canned Pacific salmon. The shore-based plant operates from early July through September and produces up to 500,000 cases of canned salmon per year.
- ***Alaska General Seafoods***– Alaska General Seafoods was established in 1999 as a division of Kanaway Seafoods. AGS was formed by merging the operations of Kanaway Seafoods with those of Nelbro Packing Company and Alaska General Processors. The primary products produced by Alaska General Seafoods are salmon related but AGS also produces herring roe and custom processes several other types of seafood.
- ***Norquest*** – Ketchikan is home to NorQuest's largest on-shore processing facility with near year-round production. NorQuest operates a large processing facility producing fresh, frozen and value added seafood products, a seafood smoking facility, hand cannery, retail store and separately located cold storage and salmon roe processing facility. Silver Lining Seafood is a subsidiary of Norquest.

Table 7.1, Figure 7.2, *and* Figure 7.3 *illustrate the weight, value, and processed value of salmon and other seafood caught and processed in the Ketchikan area. The number of pounds bought has increased by 36% and the number of pounds process has increased by 44% since 1990. The wholesale value has also increased in the same time period—by 31%—but the ex-vessel value has actually decreased 3% since 1990.*

***Table 7-1.*** **Ketchikan-Area Shore-based Processors' Buying & Production, 1990-2000**

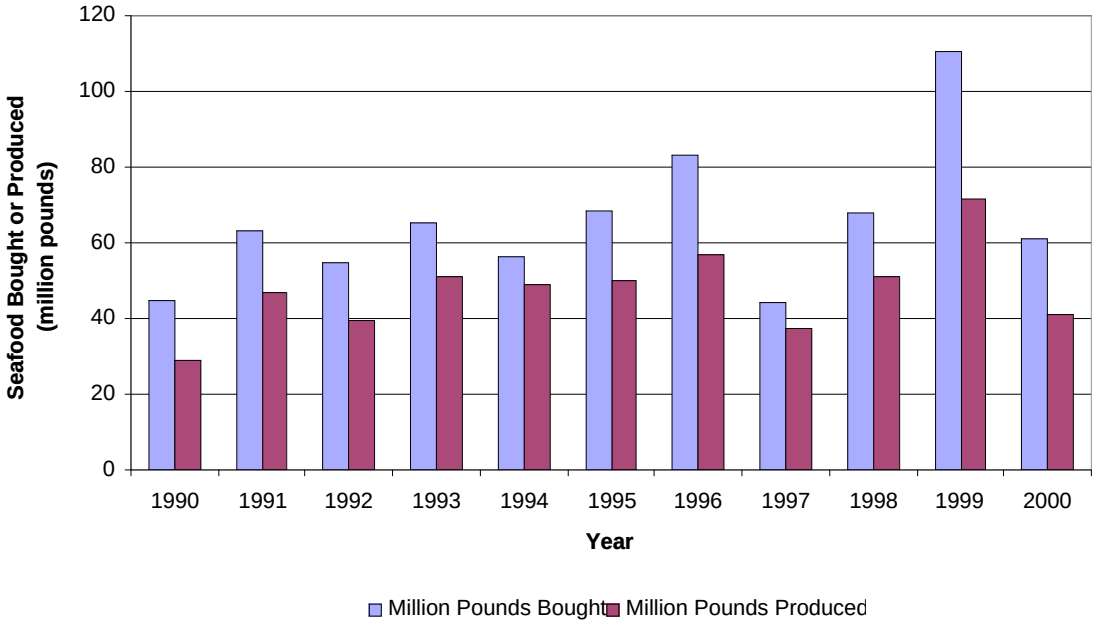
| Year | Seafood Bought | Number of Co. Buying | Pounds Bought | Ex-vessel Value | Seafood Produced | Number of Co. Processing | Pounds Produced | Wholesale Value | Value Added |
|---|---|---|---|---|---|---|---|---|---|
| 1990 | Other | 4 | 3,579,433 | $4,112,625 | Other | 4 | 6,427,573 | $11,558,282 | $7,445,657 |
| 1990 | Salmon | 5 | 41,181,773 | $21,553,938 | Salmon | 5 | 22,372,239 | $43,705,767 | $22,151,829 |
| 1991 | Other | 4 | 3,273,782 | $3,120,584 | All seafood | 5 | 46,722,982 | $56,632,763 | $53,512,179 |
| 1991 | Salmon | 5 | 59,832,135 | $16,758,923 | | | | | |
| 1992 | Other | 6 | 3,571,254 | $3,328,375 | Other | 4 | 3,886,827 | $6,313,286 | $2,984,911 |
| 1992 | Salmon | 6 | 51,026,058 | $23,022,509 | Salmon | 6 | 35,728,228 | $55,952,424 | $32,929,915 |
| 1993 | Other | 6 | 4,600,732 | $4,371,968 | Other | 5 | 4,738,740 | $7,482,473 | $3,110,505 |
| 1993 | Salmon | 7 | 60,409,593 | $19,502,367 | Salmon | 7 | 46,060,659 | $60,229,376 | $40,727,009 |
| 1994 | Other | 5 | 1,919,823 | $3,348,787 | Other | 5 | 2,586,823 | $7,169,062 | $3,820,275 |
| 1994 | Salmon | 6 | 54,224,267 | $17,345,858 | Salmon | 6 | 46,547,216 | $48,655,102 | $31,309,244 |
| 1995 | Other | 5 | 1,979,342 | $3,436,850 | Other | 4 | 1,556,703 | $4,713,868 | $1,277,018 |
| 1995 | Salmon | 6 | 66,690,192 | $20,136,036 | Salmon | 7 | 48,660,927 | $54,106,126 | $33,970,090 |
| 1996 | Other | 6 | 2,167,181 | $4,179,389 | Other | 5 | 1,831,133 | $5,591,862 | $1,412,473 |
| 1996 | Salmon | 7 | 80,919,462 | $15,330,907 | Salmon | 8 | 54,897,329 | $56,895,755 | $41,564,848 |
| 1997 | Other | 4 | 3,150,357 | $5,185,732 | All seafood | 5 | 37,233,282 | $58,177,803 | $52,992,071 |
| 1997 | Salmon | 5 | 41,124,340 | $14,320,467 | | | | | |
| 1998 | Other | 4 | 2,803,819 | $3,657,227 | Other | 4 | 2,469,763 | $7,576,438 | $3,919,211 |
| 1998 | Salmon | 4 | 65,046,009 | $16,513,321 | Salmon | 4 | 48,755,657 | $62,180,949 | $45,667,628 |
| 1999 | Other | 5 | 6,343,520 | $8,300,468 | Other | 6 | 3,571,217 | $16,945,011 | $8,644,543 |
| 1999 | Salmon | 4 | 104,030,107 | $23,927,930 | Salmon | 4 | 68,249,587 | $84,143,723 | $60,215,793 |
| 2000 | Other | 5 | 4,957,494 | $8,257,952 | Other | 5 | 2,425,381 | $9,934,590 | $1,676,638 |
| 2000 | Salmon | 5 | 55,916,154 | $16,679,422 | Salmon | 6 | 38,888,878 | $62,379,662 | $45,700,240 |

Source: Alaska Department of Fish and Game Division of Commercial Fisheries, 2002

Notes: The above data were produced for processors in Ketchikan. Only shorebased processors were included. The data represent the total pounds of seafood purchased by Ketchikan-area processors, and the total exvessel value they paid fishermen, in 1990-2000. As requested, purchases were grouped by seafood type. "Salmon" includes all salmon species. "Other" includes all other species, such as crab, shrimp, groundfish, etc.

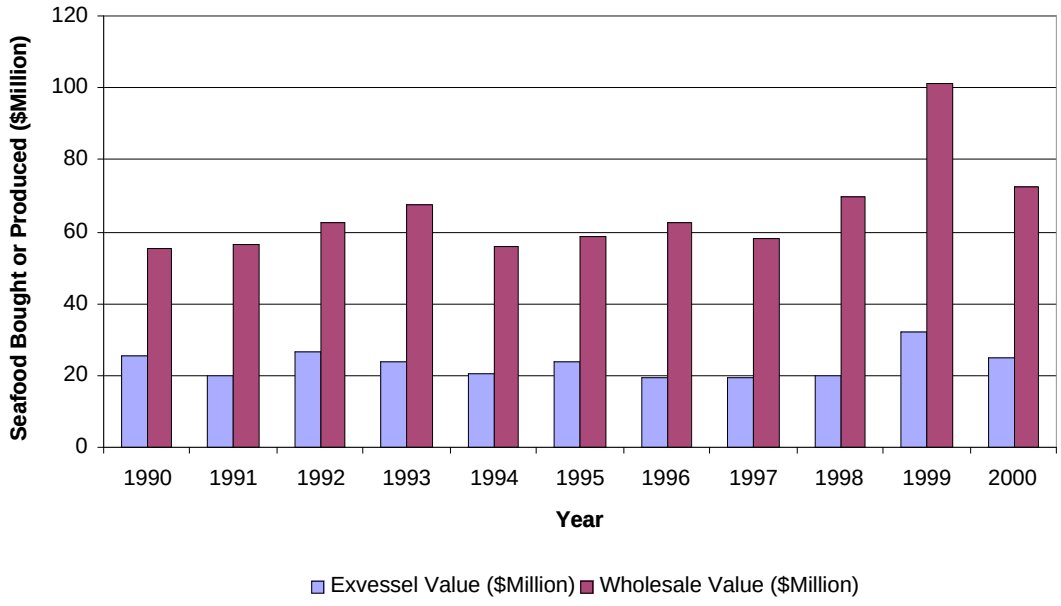
Also included in the data are the net pounds of seafood produced by Ketchikan-area shorebased processors and the total wholesale value for their production. In all years except 1991 and 1997, seafood was grouped by the same categories described above. In 1991 and 1997, "Salmon" and "Other" seafood were combined into one group to avoid releasing confidential data. In years when more seafood was produced than bought, the processors were likely processing seafood bought by other companies. In years when more seafood was bought than processed, processors could have sent seafood to other plants for processing. These differences are also reflected in the "Buyers & Processors" worksheet included in this report. In some years, a company bought but did not process seafood. In other years, a company may have processed but did not buy seafood.

*Figure 7.2. Ketchikan-Area Shore-Based Processors' Buying & Production, 1990-2000*




Source: Alaska Department of Fish and Game Division of Commercial Fisheries, 2002

*Figure 7.3 Ketchikan-Area Shore-Based Processors' Buying & Production, 1990-2000*



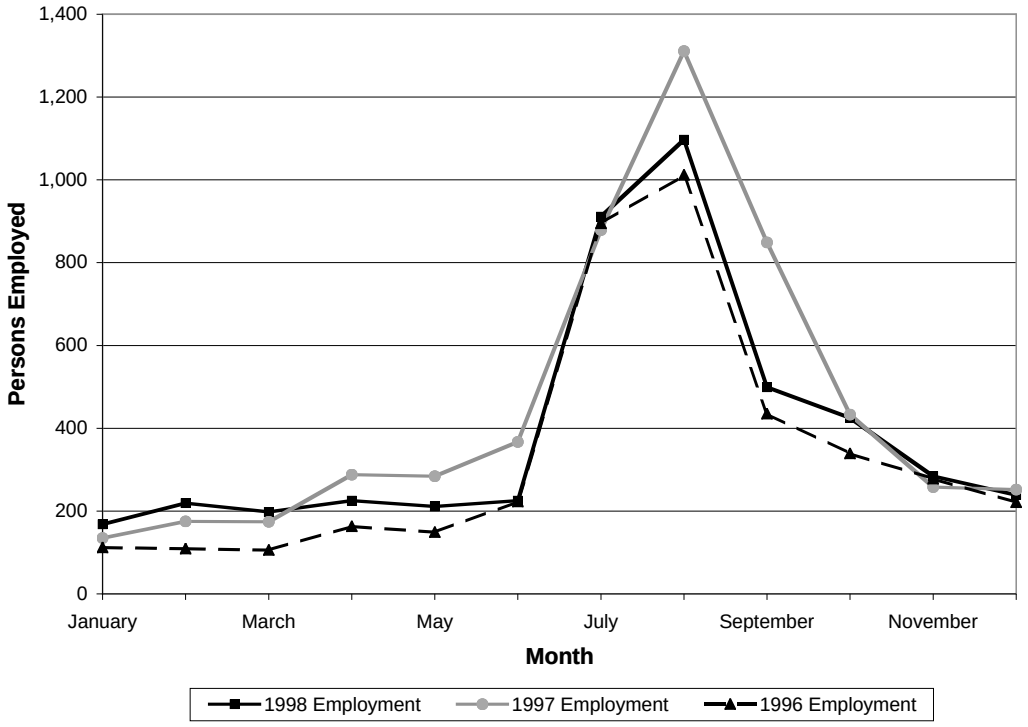

Source: Alaska Department of Fish and Game Division of Commercial Fisheries, 2002

Seafood processing in Ketchikan, like all areas of Alaska, is predominantly seasonal. In Ketchikan, the industry temporarily employs up to one thousand people during the peak season including many out-of-state residents. The largest period of seafood processing employment in

Ketchikan is during the summer salmon season, when millions of pounds of salmon are processed during a few months. The pink salmon season, which represents the majority of volume, peaks in August. The processing industry provided $10.4 million (1998) in gross earnings or about 4.4% of all gross earnings in the community.

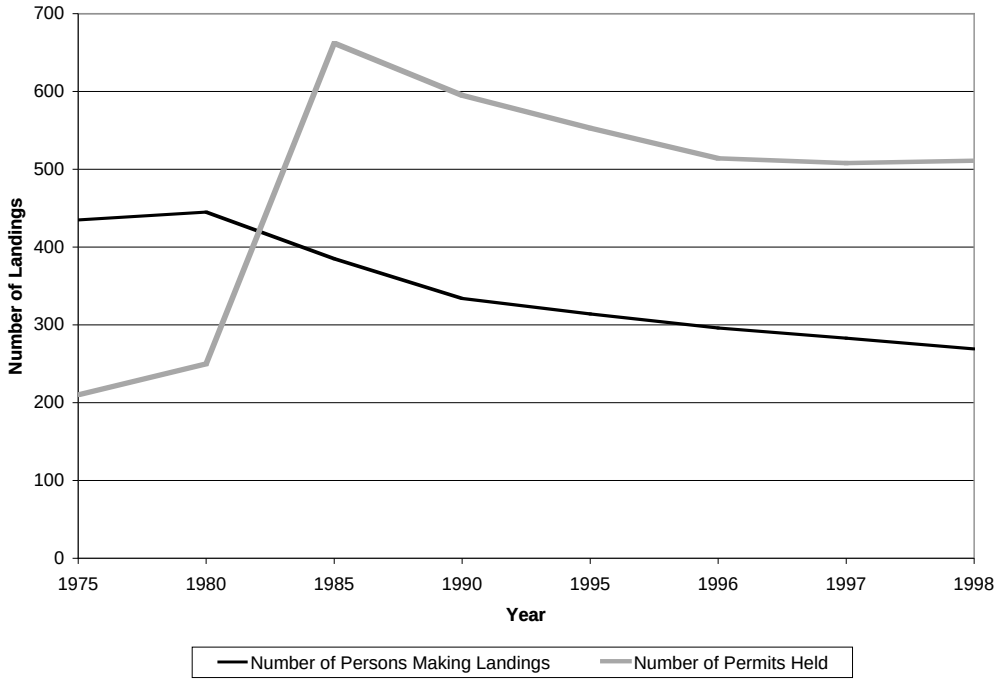
Gross earnings for the seafood processing industry in Ketchikan from 1996 to 1998 ranged from approximately $9.2 million to $10.4 million. As a share of gross earnings for all industry in Ketchikan, seafood processing was approximately 4.0% to 4.4%. Seafood processing often involves floating processing vessels that are not counted in Ketchikan seafood processing, but may purchase fish from Ketchikan resident seafood harvesters. In addition, crew members' onboard floating processors may visit Ketchikan during shore leave.

*Figure 7.4 Seafood Processing Employment in Ketchikan, 1996-1998*




The composition of the commercial fisheries effort by Ketchikan residents has changed since 1975. Although salmon remains a large portion of the commercial fisheries harvest for Ketchikan residents, the salmon hand troll and power troll effort have diminished rapidly (traditionally there has been a high rate of salmon trolling by Ketchikan residents). The salmon purse seine and salmon drift-gillnet effort in Southeast Alaska have remained relatively stable, with some slight decline. Halibut and sablefish also remain important portions of commercial fisheries landings. The relatively new sea cucumber and sea urchin dive fisheries have become a significant part of the commercial fisheries effort, and herring spawn on kelp remains a fairly large portion of the harvest effort along with shrimp pot gear (vessels under 60 feet in length).

*Figure 7.5. Ketchikan Area Resident Commercial Fisheries Landings and State of Alaska Limited Entry Permits Held, 1975-1998*



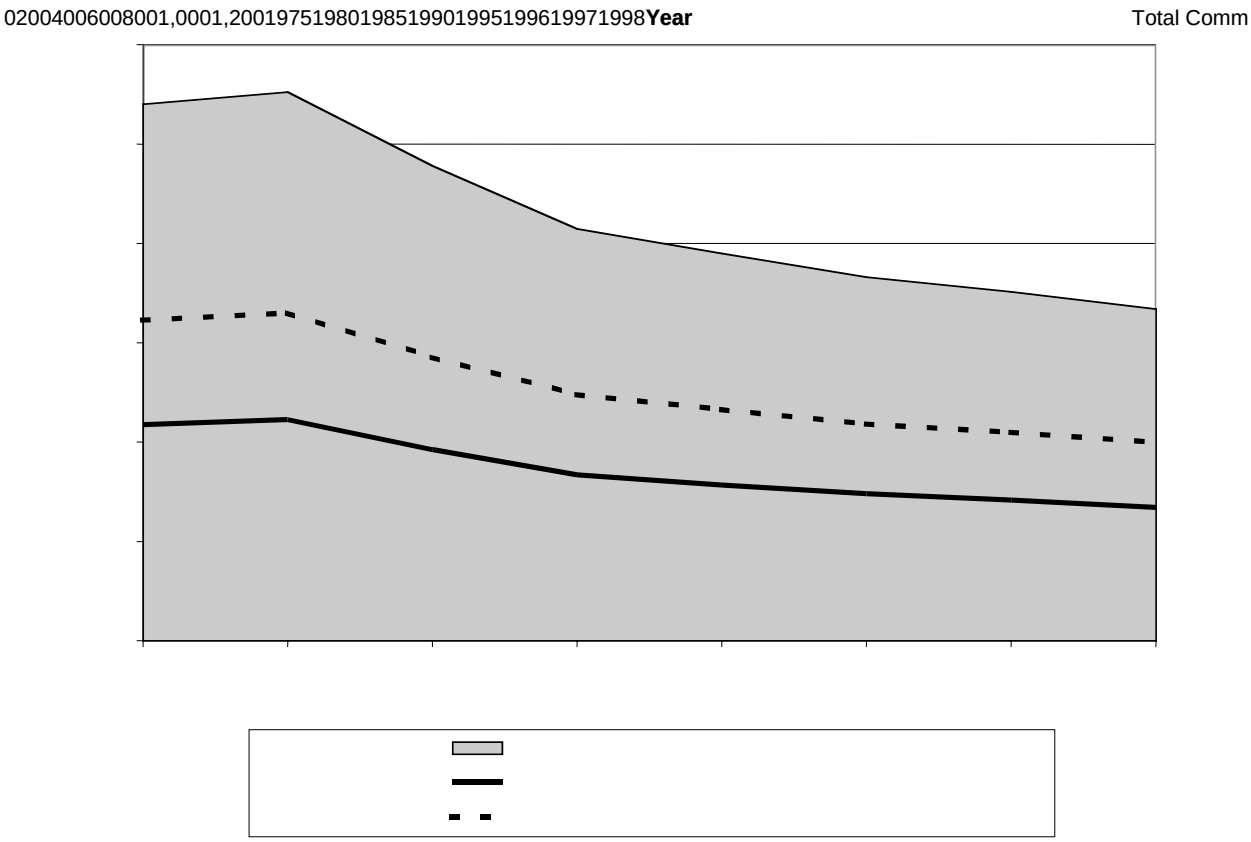

Sources: CFEC, 2000a and 2000b. Note: A commercial fisheries landing is defined as an occurrence in which a fishing vessel delivers harvested fish to a seafood processor.

Commercial fish harvesting employment declined significantly from its peak in 1980 when the industry employed approximately 1,050 people. By 1998, this number had fallen to approximately 700 people. This decline is most likely due to a decreased level of profits associated with commercial fishing and restricted access to more fisheries, resulting in a lower rate of participation. A large portion of the employment decline seems to be associated with the salmon troll fishery, which has been put under increasing restrictions over the past several years and represented an extremely large portion of commercial fishing activity by Ketchikan area residents (*Figure 7.5*). It is also believed that the increase of farm-raised salmon on the world market will continue to impact this fishery.

The number of persons making commercial fisheries landings in the Ketchikan area does not represent the total number of persons employed in commercial fish harvesting activities. Many vessels also employ crewmembers that are not recorded in landing numbers. There are several fisheries in which Ketchikan residents participate that may not involve crewmembers, or may involve the entire crew being counted in landing figures because crewmembers also hold permits (quota shares). Some of these fisheries are the sea urchin and sea cucumber dive fisheries, the salmon troll fisheries, and the halibut and sablefish Individual Fishing Quota (IFQ) fisheries. Some vessels in other fisheries may not involve crewmembers. Conversely, those vessels participating in salmon seine, herring seine, salmon drift gillnet, herring gillnet, crab, and shrimp fisheries may involve multiple-person crew sizes of up to four persons per vessel, including the vessel operator. *Figure 7.5* displays an estimated range of employment in the commercial fish harvesting industry by Ketchikan area residents. The figure uses active permit holder data and

crewmember data reported by CFEC.[1] As shown in *Figure 7.6*, commercial fish harvesting employment in 1997 was approximately 700 individuals. The number of individuals employed in commercial fishing peaked around 1980 and has since declined. This decline is likely attributable to a decreased level of profits associated with commercial fishing and restricted access to more fisheries, resulting in a lower rate of participation. A large portion of the employment decline seems to be associated with the salmon troll fishery, which has been put under increasing restrictions and market pressures over the past several years and represented an extremely large portion of commercial fishing activity by Ketchikan area residents.

*Figure 7.6 . Commercial Fishing Employment of Ketchikan Area Residents, 1975-1998*




Sources: CFEC 2000a, 2000b, and 2000c.

The Existing Conditions Report of the Demographics and Socioeconomics Analysis for Ketchikan 2020 and the Gravina Access Project (HDR 2000) provides further detailed analysis of the economy of the Ketchikan Gateway Borough with respect to fish and seafood processing.

Rising domestic and world demand for quality seafood, and the availability of seed from the State-owned shellfish hatchery in Seward, present an opportunity for Ketchikan to diversify its seafood industry with mariculture activities. Mariculture activities require clean water since filter-feeding products destined for human consumption must meet strict quality standards. Therefore, mariculture activities should located in areas of low human development where they

[1] Pre-1998 crewmember counts are estimates based on a ratio of crewmembers to active permit holders in 1998. Crewmember counts were readily available for 1998 only.

will not disrupt other established uses such as traditional fisheries and recreation. Commercial dive fisheries occur on the west side of Gravina Island. Aquatic geoduck clam farms have been permitted on the west side of Gravina Island in areas where stocks sufficient to support the commercial dive fishery are not known to exist. Areas on the west side of Gravina Island where large densities of geoduck clams have previously existed are suitable for mariculture enhancement activities. *Figure 7.7* illustrates potential mariculture/aquaculture locations within the Coastal District consistent with the needs of the activity. These site were previously identified by the State during a review of potential mariculture locations throughout Southeast Alaska.

## Resource Analysis

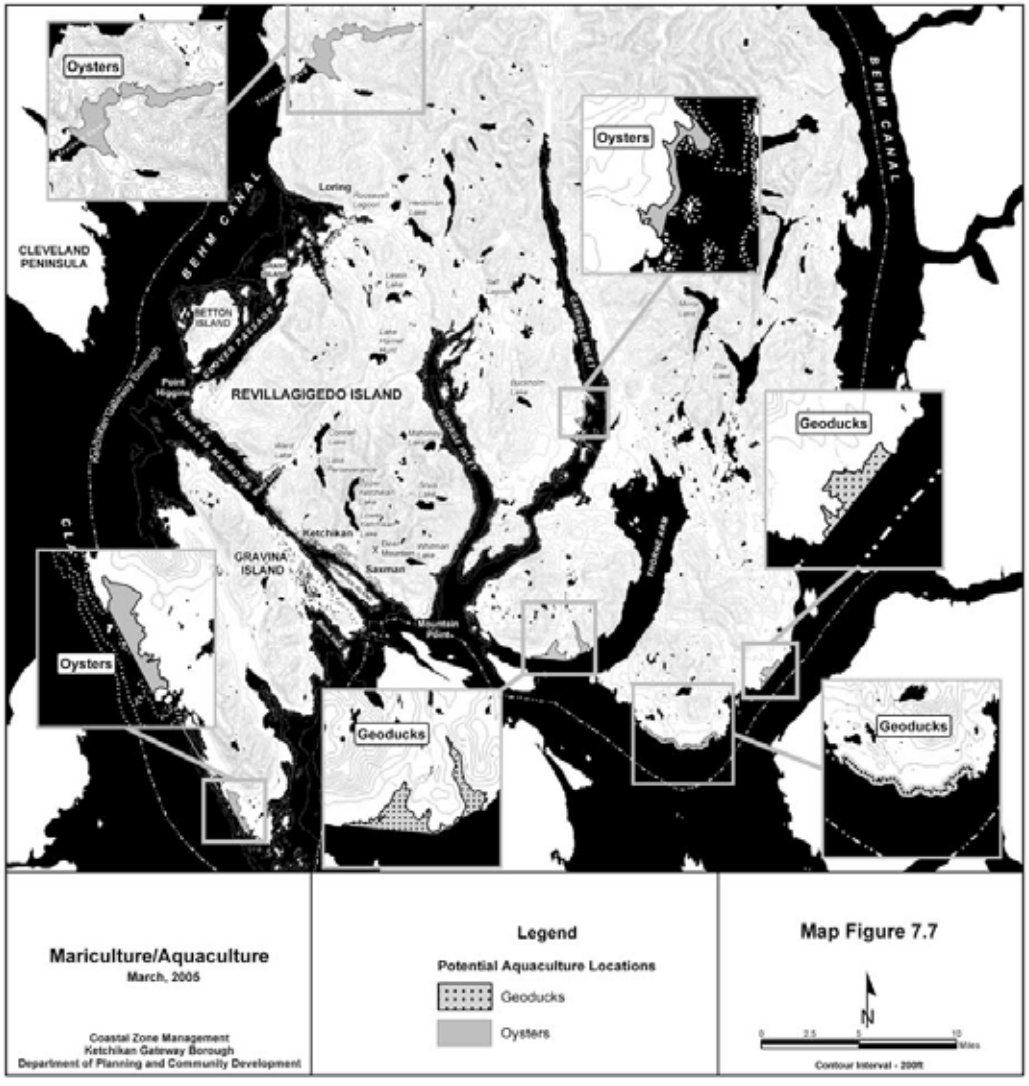
*Present and Anticipated Needs.* The community's specific present and anticipated fish and seafood processing needs include:

- Provision of cold storage facilities
- Identification and development of suitable mariculture locations
- Monitoring water quality to understand impacts of waste discharges
- Implementation of waste disposal strategies to minimize adverse impacts
- Establishment of predictable government regulations to facilitate industry development
- Provision of temporary worker housing
- Minimizing impacts associated with seafood processing odors
- Planning for diversification and industry growth

*Direct and Indirect Impacts*. Fish and seafood processing plants can have a direct impact on marine water quality and surrounding land uses by discharging fish waste from out-falls adjacent to plant facilities. Although the four seafood-processing plants in the Borough operate under a general permit regulated by the EPA, the most obvious impact to environmental quality is odor resulting from anaerobic decomposition of fish waste resulting in offensive "burps" during peak periods. These gas burps can be especially noxious in the downtown area due to residential and commercial population density. There are, however, possible solutions to this impact that are being explored so that industry growth can occur compatibly with surrounding land uses. Other compatibility issues include the attraction of birds to outfall locations that can impact the operation of floatplanes in Tongass Narrows. The industry can also seasonally impact the housing supply for temporary workers.

*Suitability and Sensitivity.* The seafood industry relies on large quantities of clean water, seasonal out-of-state labor, affordable housing, and easy access to roads and docks for suitable locations of processing plants. The marine environment can be sensitive to seafood processing discharge outfalls. Making sure outfalls are properly permitted and situated to discharge in underwater areas with good flushing action can help mitigate impacts.

*Conflicts Among Uses and Activities*. Conflict can occur between processing facilities and adjacent uses such as residential development (noise, traffic, and odors) and floatplane facilities (attraction of birds). Non-commercial shellfish harvest can be impacted or displaced by seafood facilities. The location of processing facilities could also conflict with the needs of the tourist industry. Outfalls can emit objectionable odors when located near docks or attractions where tourists, ferry riders, or private boat owners frequent. It is important to locate mariculture facilities in areas not claimed by existing commercial fisheries (such as dive fisheries) and where operation of the facility would not conflict with other users such as recreation.


Oysters
Oysters
Geoducks
Geoducks
Geoducks
Oysters
BEHM CANAL
BEHM CANAL
CLEVELAND PENINSULA
REVILLAGIGEDO ISLAND
GRAVINA ISLAND
METTON ISLAND
Loring
Ketchikan
Saxman
Mountain Point
Point Higgins
Tongass Narrows
Clarence Strait
Mariculture/Aquaculture
March, 2005
Coastal Zone Management
Ketchikan Gateway Borough
Department of Planning and Community Development
Legend
Potential Aquaculture Locations
Geoducks
Oysters
Map Figure 7.7
N
0 2.5 5 10 Miles
Contour Interval - 200ft

# Timber Harvest and Processing

## Resource Inventory

The forest products industry has been an important part of Ketchikan's economy for more than half a century. Sitka spruce, hemlock, and other species have been exported as logs, lumber, and timber for the past 40 years. The lower-quality timber was used to produce dissolving pulp, which was sold to produce rayon, pharmaceuticals, and paper products.

Recent changes in the world market and forest land management have adversely affected the industry in Southeast Alaska. Asian markets experienced downturns in price and demand and, in 1997, the Tongass Land Use Management Plan reduced allowable harvest levels. The Sitka pulp mill closed in 1993 and the Ketchikan pulp mill closed in 1997. As shown in *Figure 8.1*, Ketchikan historically produced a large percentage of Southeast Alaska's timber. Seeley Corporation (located on Gravina Island), is the largest mill operating in the Borough. The industry in Southeast Alaska is responding with a new focus on value-added processing.

In its Central/Southern Southeast Area Plan, the State identifies a number of parcels of land as suitable for possible timber harvest: lands on Gravina Island in the Bostwick Lake and Vallenar Bay areas, Sunny and Spacious Bays on the Cleveland Peninsula, areas in the western part of Revillagigedo Island adjacent to Behm Canal, and the edge of Upper George Inlet. Traitor's Cove, Neets Bay, and areas southwest and southeast of the Salt Chuck are areas that have been previously harvested and may be again. Areas where settlement may occur are also identified as possible timber resource locations (Ibid.). More detailed information on state timber harvest and processing is available from the Central/Southern Southeast Area Plan Public Review Draft (December 1999).

State DNR expects to harvest 3.8 mmbf on 140 acres of land south of Bostwick Lake and may also harvest 350 acres southwest of the lake. These harvests occur independently or concurrently with USFS activities. Both DNR and USFS sales require building a road from Bostwick Lake to a Tongass Narrows log transfer facility. DNR also owns 900+ acres in the Vallenar valley, over half of which is mature, commercial quality mixed spruce and hemlock forest. Harvest is expected to occur during the 20-year planning period. The University Trust, which owns adjacent land, may coordinate harvest with DNR. The Mental Health Trust has timber in commercial quantities along the proposed Bostwick Lake Road and in ravines west of the airport. Borough-owned lands north of the airport and near Blank Inlet also contain some commercial timber volumes.

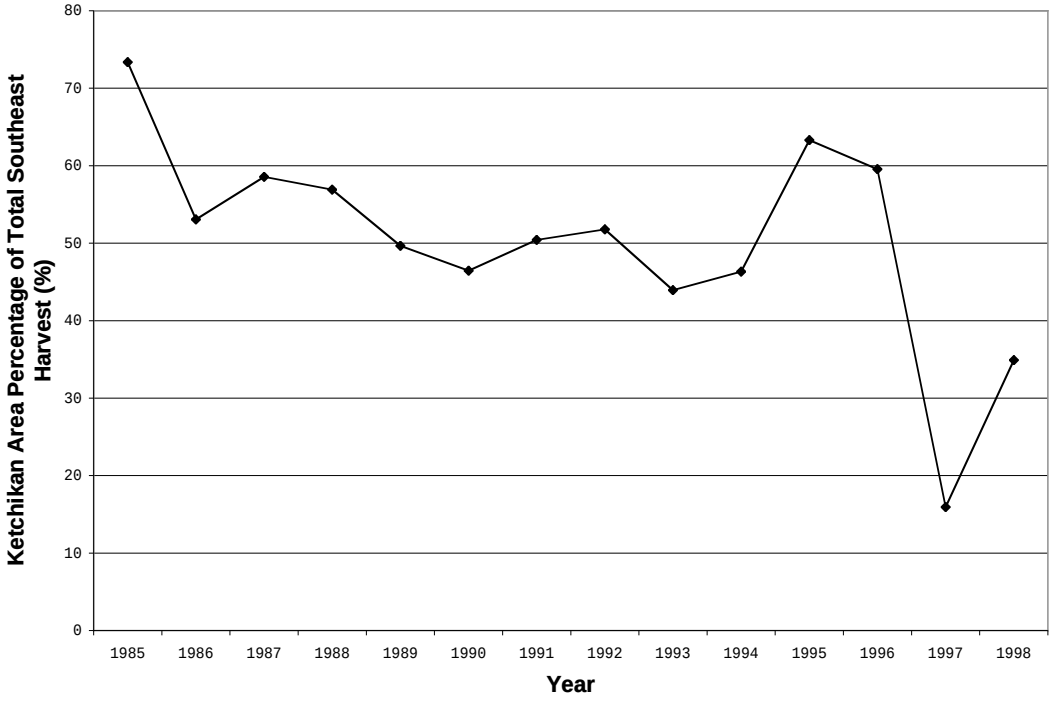
Areas along Carroll Inlet, and within the drainages of Carroll River, and Margaret, Traitor's and Orchard Creeks are all areas the Tongass Land Management Plan considers suitable for timber harvest (USFS 1997). Some areas adjoining smaller bays are also possible timber harvest sites.

On Gravina Island, the Forest Service anticipates a 31-38 million board foot (mmbf) harvest over 1,800 to 2,200 acres during the 1997-2007 planning period. Depending on the alternative chosen, the harvest will include 60 to 79 units with an average size of 30 acres. This harvest represents 27-33% of Forest Service land identified as suitable for harvest under the current plan conducted over a 200-year rotation.

Because of changes in the forest products industry, including reduced supply of Tongass National Forest timber and lower quality of the remaining timber inventory, producers in Ketchikan have begun to explore and develop value-added markets. *Figure 8.2* shows timber harvests in

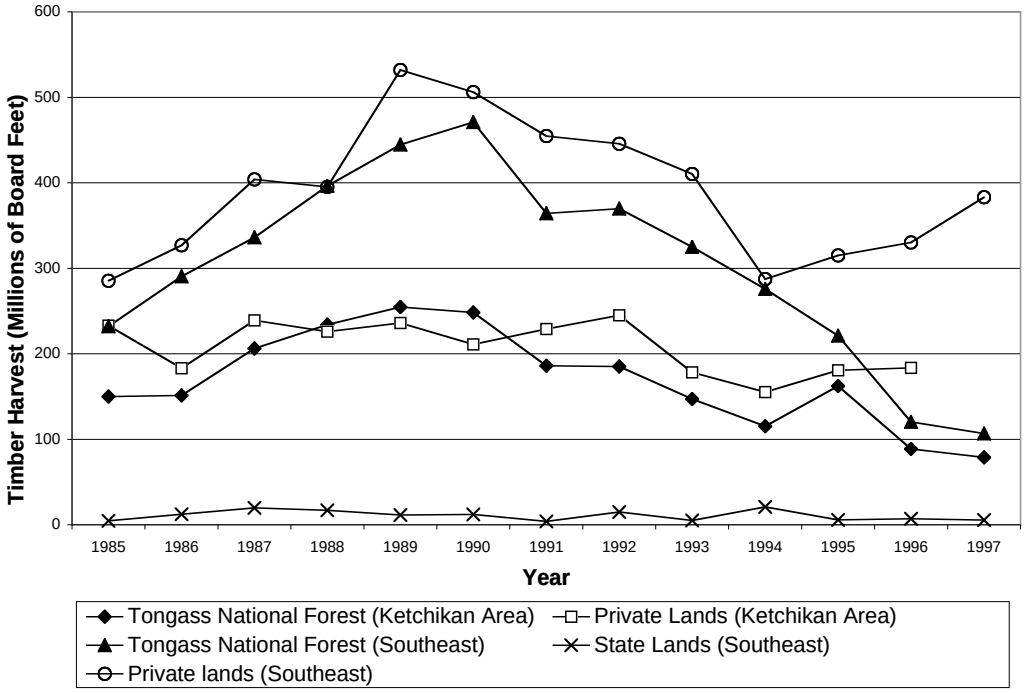
Southeast Alaska and the Ketchikan area for the last few years. Weak Japanese markets, pulp mill closures, and declining and unpredictable timber supply have caused the Tongass harvest to be the lowest in years.

*Figure 8.1. Ketchikan Area Percentage of Total Southeast Harvest, 1985-1998*




Source: U.S. Forest Service (USFS), 1998, and Ketchikan Gateway Borough, 1999.

*Figure 8.2. Ketchikan Area and Southeast Alaska Timber Harvest, 1985-1997*




Source: USFS, 1998, and Ketchikan Gateway Borough, 1999.

The Existing Conditions Report of the Demographics and Socioeconomics Analysis for Ketchikan 2020 and the Gravina Access Project (HDR 2000) provides a detailed analysis of the economy of the Ketchikan Gateway Borough with respect to forest products.

## Resource Analysis

*Present and Anticipated Needs.* Ketchikan has historically produced a large percentage of Southeast Alaska's timber, and therefore is being affected by the many changes in the industry. Although the community has suffered declines in population and employment since the closure of the Ketchikan Pulp Mill in 1997, the industry is expected to retool for more value-added processing of wood products. One example of this value-added strategy is the dimensional lumber produced at Pacific Log and Lumber (Steve Seeley et al) on Gravina Island. It is also possible that the former Gateway Forest Products veneer mill will be brought back on line. The State and the U.S. Forest Service have identified selected locations on Revilla and Gravina Islands as suitable for timber harvest. Present and future needs for industry expansion will include an adequate supply of timber and the ability to secure individual permits for facility expansions including roads, docks, bulkheads, log transfer facilities and other infrastructure.

*Direct and Indirect Impacts.* The Alaska Forest Resources and Practices Act regulate the direct and indirect impacts of timber harvest and processing on private land. The regulations and procedures adopted under that chapter with respect to the harvest and processing of timber, are incorporated into the Alaska coastal management program and constitute the components of the coastal management program with respect to those purposes. Harvest on Federal property is regulated by a number of items including the Tongass Land Management Plan, the Clean Water

Act, the Clean Air Act, among others, and conducted under the auspices of the National Environmental Protection Act.

*Suitability and Sensitivity*. Almost 95% percent of the land in the Ketchikan Gateway Borough is owned and managed by the U.S. Forest Service. Areas appropriate for different levels of timber harvest, along with other uses of the forest, have been identified in the Tongass Land Management Plan. Other public and private land owners also have lands suitable for timber harvest. Proper management of the forested areas for timber production would continue to support the timber economy in the Borough. Forest areas also provide shelter and forage habitat for a variety of animals as well as a variety of recreation and subsistence opportunities.

*Conflicts Among Uses and Activities*. Conflicts can arise when timber harvest and logging roads are suggested for areas that are popular for remote subsistence, hunting, fishing, recreation, or those that have cultural significance. In addition, the location of harvest areas can conflict with scenic views enjoyed by both local citizens and visitors. These conflicts, however, are generally addressed in Tongass wide forest planning as well as during environmental review of individual sales. The current preparation of the Gravina Island timber sale by the U.S. Forest Service is a good example of how these conflicts can be thoroughly addressed through a well coordinated planning process that includes all of the affected constituents. In this manner, possible alternatives are well defined and allow very specific choices regarding how to best balance the sometimes competing demands for use of the forest. In addition, coordinated inter-governmental planning can present specific opportunities for items such as roads, fulfillment of local recreation needs, and use of existing industrial infrastructure in Tongass Narrows for log transfer.

# Mining, Sand and Gravel

## Resource Inventory

Although the Ketchikan area has a history of mining activities, there are currently no active claims with the exception of rock, sand, and gravel extraction. There are four rock quarry sites certified for state road paving in the Ketchikan area: two near Carlanna Creek, one near Whipple Creek, and one on the South Tongass Highway. Although the sites have not been tested, additional rock, sand, and gravel deposits occur at Whipple Creek, on Borough-owned land at Mile 16 North Tongass Highway, and Vallenar Bay, and between Ketchikan Lake and the city landfill. *Figure 8.1* illustrates selected areas of existing or potential mining and mineral processing.

The molybdenum deposit located at Quartz Hill inside the Misty Fjords National Monument is the largest known commercially viable mineral in the Ketchikan vicinity, located on the mainland between the Keta and Blossom Rivers, across from Behm Canal. Quartz Hill potentially contains 10 percent of the world's known molybdenum and could employ 1,000 people during its anticipated 50 to 70-year life according to old estimates. Currently, the mine is not in operation.

In 1999, the Bureau of Land Management conducted an aerial mineral survey of the western and eastern portions of Gravina Island, including 1,300 acres of Borough land near Blank Inlet. Although the survey did not draw conclusions regarding mineral locations, the data collected will be used to locate and guide future exploration activities.

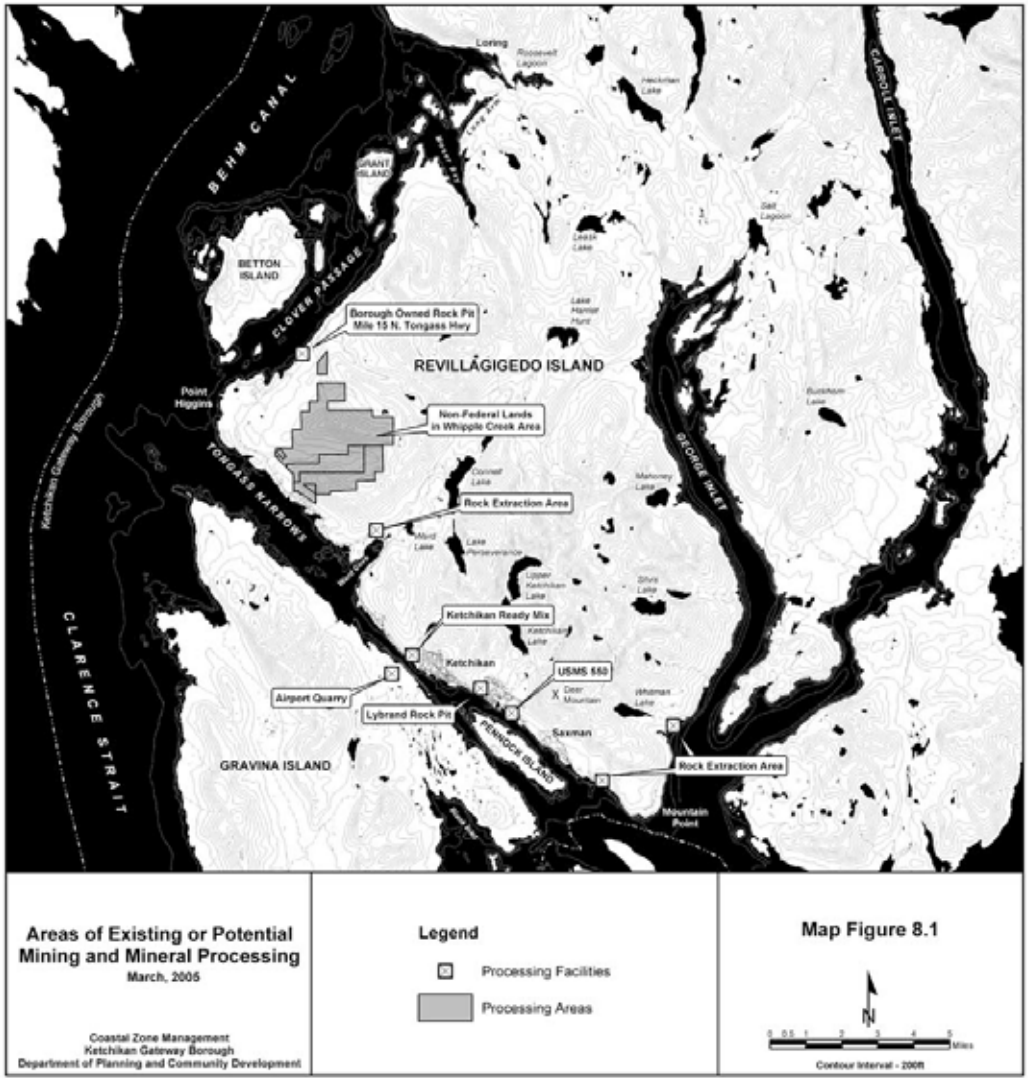
Around 1900, gold was discovered in the Ketchikan area. It was mined on Gravina Island until 1913. The most probable economic mineral resources on Gravina Island now are copper, barite, and iron, concentrated in the Dall Head area. Federal lands in this area have a land use designation of Minerals Intensive Development that acknowledge the potential presence of minerals there.

## Resource Analysis

*Present and Anticipated Needs.* Community needs for rock, sand, and gravel will grow consistent with the pace of development. Due to steep topography and shallow wetlands, very few sites in the Borough develop with a balance of cut and fill. This typically necessitates either the export or import of crushed rock on individual sites during the normal course of site development.

Economic development needs in the community would direct the further exploration and development of potential mineral deposits. It is expected that such activities could occur during the planning period.

*Direct and Indirect Impacts*. The development of a mining industry could provide a new source of year-round, well-paying employment to substitute for losses in other industries. Surface mining, however, can have a direct impact on scenic views and water quality if not managed properly. Normal site development activities in Ketchikan often necessitate the operation of temporary quarry activities to provide suitable grades. Often times these activities are located within developed areas. In residential areas, temporary, direct impacts include dust, noise, truck traffic, siltation, erosion, and potential for mass failure. Runoff from future mining and quarry activities will need to avoid direct impacts on the water quality of rivers and streams, which can


BEHM CANAL
CLARENCE STRAIT
CARROLL INLET
GEORGE INLET
TONGASS NARROWS
Ketchikan Gateway Borough
GRANT ISLAND
BETTON ISLAND
CLOVER PASSAGE
Point Higgins
Borough Owned Rock Pit
Mile 15 N. Tongass Hwy
REVILLAGIGEDO ISLAND
Non-Federal Lands
in Whipple Creek Area
Rock Extraction Area
Ketchikan Ready Mix
Ketchikan
Airport Quarry
USMS 550
Lybrand Rock Pit
Saxman
GRAVINA ISLAND
PENNOCK ISLAND
Rock Extraction Area
Mountain Point
Areas of Existing or Potential
Mining and Mineral Processing
March, 2005
Coastal Zone Management
Ketchikan Gateway Borough
Department of Planning and Community Development
Legend
Processing Facilities
Processing Areas
Map Figure 8.1
N
Contour Interval - 200ft

have an indirect impact on fish and other wildlife. Impacts to fish and wildlife could affect subsistence users as well as sport and commercial hunters and fishers.

*Suitability and Sensitivity*. The lack of level land and the large of supply of rock materials, make quarry development a suitable use of mineral resources in the district. Residential neighborhoods are particularly sensitive to quarry activity due to noise, air quality, and visual impacts. Typically, residents do not want to see or hear mining operations close to homes. Quarry activities can affect residential development and decrease property and housing values in areas near the mining activity. Waterways downstream of mining activity are sensitive to runoff from tailings that could degrade water quality. Wildlife habitat and residential development near mining facilities is sensitive to the noise and water pollution that can be generated by such facilities if not well managed. The visitor industry can also be sensitive to mining activity if mines are located near tourist routes or destinations.

*Conflicts Among Uses and Activities.* Where potential mineral sites are near waterways mining activity can conflict with use of these areas by other users such as hunters, fishermen, subsistence users, and hikers. Conflicts can also occur with homeowners not wanting mining activity near or in their neighborhood for the reasons mentioned above. The visitor industry can also conflict with mining operations because of the potential of impacts to scenic views and dust.

# Coastal Habitats, Fish, and Wildlife

## Coastal Habitats Resource Inventory

### Offshore Areas

Southeastern Alaska is composed of 15,000 miles of shoreline. Rocky intertidal habitats, consisting of bedrock or boulders with considerable marine algae and invertebrate (mussels and barnacle) growth, characterize much of the coastline (O'Clair et al. 1997). Additionally, intertidal wetlands, or salt marshes, develop at many river mouths and heads of bays protected from wave action and alongshore currents. Important subtidal habitats in Southeast Alaska include kelp beds that grow in rocky areas offshore and beds of eelgrass that grow in many sandy areas associated with protected bays (*Figures 9.1 and 9.2*).

According to the Alaska CMP, offshore areas are defined as all waters and submerged lands 3 miles seaward of the shoreline. These areas provide habitat for marine mammals, anadromous fish, marine fish, seabirds, shellfish, marine plants, and microorganisms. Because the Ketchikan Gateway Borough is located in protected inland waters, there are no official "offshore areas" present within the coastal district. Despite this, marine waters in the Borough provide habitat for similar species. Table 12-1 presents significant marine waters in the Borough.

In the Ketchikan Gateway Borough, all five species of salmon are present and use marine waters. The bays and coves of the area provide a protected habitat for Dungeness crab, Alaska king crab, and tanner crab. Shrimp and abalone and other shellfish are found in the coastal waters near the Ketchikan Gateway Borough. Geoduck clams are commonly found in tideflats in Vallenar Bay of Gravina Island. Marine mammals that frequent marine waters of the Ketchikan Gateway Borough include Steller sea lion, humpback whale, killer whale, Dall porpoise, Pacific white-sided dolphin, minke whale, and harbor porpoise.

**Table 9-1. Significant Marine Waters**

| **Revillagigedo Island** | | |
|---|---|---|
| • Neets Bay | • Leask Cove | • Herring Bay |
| • George Inlet | • Naha Bay | • Behm Canal |
| • Gedney Pass | • Hassler Pass | • Tongass Narrows |
| • Thorne Arm | • Princess Bay | • Clover Passage |
| • Shrimp Bay | • Ward Cove | • Mud Bay |
| • Klu Bay | • Moser Bay | • Traitors Cove |
| • Carroll Inlet | • Rockfish Cove | • Fire Cove |
| • Carroll Cove | • Manzanita Bay | • Sargent Bay |
| • Ella Bay | • Wasp Cove | • Lucky Cove |
| • Moth Bay | • California Cove | • Shoal Cove |
| • Gem Cove | • Coon Cove | • Gnat Cove |
| • Alava Bay | • Shelter Cove | • Coho Cove |
| • Tsa Cove | | |
| **Gravina Island** | | |
| • Vallenar Bay | • Grant Cove | • Nelson Cove |
| • Clam Cove | • Blank Inlet | • Bostwick Inlet |

| | | |
|---|---|---|
| • Seal Cove | • Dall Bay | • Nehenta Bay |
| • Nelson Cove | • Nichols Passage | |

**Tongass Narrows Marine Habitat**

Tongass Narrows is a relatively narrow channel running between Gravina Island and Revillagigedo Island in southeastern Alaska. The southeastern end of the narrows splits into the East Channel and West Channel around Pennock Island. At the south end of Pennock Island, the narrows meets the northern end of Nichols Passage. The northwestern end of the narrows opens into Clarence Strait.

Tongass Narrows is characterized by strong tidal currents and by steep bedrock or coarse gravel/cobble/boulder shorelines. The waterway experiences strong tidal currents (Table 12-2).

**Table 9-2. Tide Information for Tongass Narrows**

| | |
|---|---|
| Extreme High Water (EHW) | +21.3 ft |
| Mean Higher High Water (MHHW) | +19.4 ft |
| Mean High Water (MHW) | +14.4 ft |
| Sea Level | +8.0 |
| Mean Low Water (MLW) | +1.5 ft |
| Mean Lower Low Water (MLLW) | 0.0 ft |
| Lowest Tide | -5.2 ft. |

From: National Oceanic and Atmospheric Administration (NOAA), July 1978.

In undeveloped areas, mainly on Gravina and Pennock Islands, much of the lower intertidal and shallow subtidal areas are sandy or mixed gravel, sand and shell, with varied amounts of silt. Rocky points, mainly along the northwest shore of Pennock Island, have steep bedrock slopes extending to subtidal depths. Several small natural coves and areas protected by constructed breakwaters provide wave and current protection for anchorages and marine habitats. These locations have sandy or gravel bottoms.

Fifty-six plant and 137 animal taxa were identified in fieldwork completed in the intertidal zone in January 2000. In areas where natural coarse gravel/cobble/boulder shorelines occur, rockweed (*Fucus gairdneri)*, barnacles (*Balanus glandula*, *B. crenatus*, *Semibalanus cariosus*) *Chthamalus dalli*), snails (*Littorina scutulata*, *L. sitkana*, Lottidae, unidentified), and crab (*Hemigrapsus nudus*) dominated. In areas where seastars (*Pycnopodia helianthoides*) were limited, intertidal areas had abundant mussel (*Mytilus edulis*) populations.

In developed areas along the west shoreline of Revillagigedo Island in and near the City of Ketchikan, extensive areas of the riprap-protected bank and intertidal fill occur. Additionally, the shoreline in this area has been modified by the construction of numerous buildings on pilings. About one mile of the shoreline of Gravina Island in the vicinity of the airport and airport ferry have been similarly modified. These areas are mainly dominated by rockweed, barnacles (*B. glandula*, and *Chthamalus dalli*), and snails (*Littorina scutulata*).

Subtidal margins of Tongass Narrows are characterized by steeply sloping bedrock or coarse gravel/cobble bottoms extending from the lower intertidal zone to the deeper flatter center of the channel at depths of -80 to -150 ft MLLW. For the most part, these subtidal slopes are swept by strong tidal currents and support a number of kelp and other algal species down to depths of about -40 ft MLLW. The primary algal taxon in the subtidal area is *Laminaria* spp. which covers much of the bottom. In spring and summer, many of these rocky areas support a canopy of bull kelp (*Nereocystis luetkeana*). At depths below –40 MLLW, the bottom becomes nearly barren sand

and gravel. The most abundant subtidal organism observed in the district in the winter is sea cucumber (*Parastichopus californicus*).

Shallow subtidal areas that are protected from direct impact of the currents in small coves or behind breakwaters have gradually sloping sandy bottoms that often support healthy eelgrass beds. Eelgrass beds are found along in shallow waters along Revillagigedo Island north of Refuge Cove, near the floatplane dock south of the mouth of Ward Cove, north of the Amerigas dock, north of the Bar Point Marina breakwater, and south of the entrance to the Thomas Basin Marina. Eelgrass beds are found in shallow waters adjacent Gravina Island between the small cove north of the runway to the floatplane dock and just south of the sunken tugboat in Tongass Narrows West Channel.

Detailed information pertaining to the marine environment of Tongass Narrows is available from the Phase 1 Marine Reconnaissance Report for the Gravina Access Project (Pentec Environmental 2000).

### Estuaries

According to the Alaska CMP, "Estuaries are an ecological system at the mouth of a stream where fresh water and salt water mix, and where salt marshes and intertidal mudflats are present. The landward extent of an estuary is the limit of salt-intolerant vegetation, and the seaward extent is a stream's delta at mean low water." Estuaries provide nutrients, food and shelter to many species of fish, shellfish, and shorebird populations. They are highly productive habitats and much of the organic matter produced within them washes into the marine ecosystem where it supports food webs. The beach meadows are important feeding areas for many terrestrial and aquatic species of wildlife, including deer, black bear, river otter, mink, shorebirds, waterfowl, and songbirds. They provide succulent forage in spring when other habitat types may be snow-covered. They also serve as nurseries for young fish. Estuarine habitats are considered relatively scarce in Southeast Alaska.

Estuarine meadows exist along the shore of Gravina Island. At elevations near the highest tides, these meadows are dominated by grasses, and sedges and herbs are prominent near the more average high tide elevations. These meadows may be supported by seepage of freshwater out of the beach gravels. Vallenar Bay and Blank Inlet are high-value estuarine environments on Gravina Island. Other high-value estuaries within the Ketchikan coastal district include Salt Lagoon and Leask Cove at the head of George Inlet, Roosevelt Lagoon in the lower Naha River drainage, the estuarine wetlands and tidal flats at the mouth of the Carroll River in Upper Carroll Inlet, and the Herring Bay area.

### Wetlands and Tide-flats

Wetlands and tide-flats are highly diverse habitats that occur in the interface between land and water. Wetland ecosystems support vegetation that can grow partially submerged in water periodically or continuously. Due to the large amount of rainfall, a large proportion of the Borough's uplands (non-marine environment) is considered wetland habitat. Wetlands and tide-flats provide important habitats for waterfowl, seabirds, seals, sea lions, spawning fish, and deer and bear. Clam, crab, and abalone concentrate in these areas as well. Wetlands are rich in nutrients and vegetation and serve such functions as ground water recharge and discharge in the district area.

Five main wetland types are present in the Ketchikan Gateway Borough:

- Estuarine: coastal and marine wetlands including freshwater/saltwater interface
- Lacustrine: lakes
- Palustrine: muskegs and bogs
- Riverine: rivers
- Forested: needle-leaved evergreen

Examples of high-value wetlands are located at Roosevelt and Upper George Inlet salt lagoons, Vallenar Bay, Blank Inlet, and the remnant estuarine wetlands at Herring Cove, Mud Bight, and Ward Cove.

The tideflats of the area are generally adjacent to estuaries and lagoons. The most significant tideflats are located at the mouth of Vallenar Bay on Gravina Island and at the head of Carroll Inlet (*Table 9-3*).

**Table 9-3. Significant Tidal Flats**

| | |
|---|---|
| **Revillagigedo Island** | |
| • Moser Bay | • Traitors Cove |
| • Portage Cove | • Grace Cove |
| • Manzanita Bay | • Ella Bay |
| • Carroll Inlet | • Coon Cove |
| • Gnat Cove | • Shoal Cove |
| • Leask Cove | • Herring Cove |
| **Gravina Island** | |
| • Bostwick Inlet | • Seal Cove |
| • Nelson Cove | • Vallenar Bay |

***Ketchikan Area.*** The U.S. Fish and Wildlife Service, through its National Wetlands Inventory (NWI) program, has prepared broad-scale maps of wetlands in the Ketchikan area. Those maps show that almost all of the lowlands on the Tongass Narrows side of Gravina, as well as most of the land on Pennock Island, is wetland, the only substantial exception being developed areas. Based on the NWI maps and field visits, the predominate wetlands are forested, palustrine "muskeg"-type, and estuarine meadow (Leggett 2000).

***Gravina Island.*** Forested wetlands are prominent northwest of the airport. They are generally drier than other wetlands, either because they are topographically steeper, or because their substrates drain better internally. They are found along larger creeks and as a fringe along the beaches of Gravina and Pennock Islands. They are also interspersed with the "muskeg" wetlands. A mix of conifer species, including shore pine, red and yellow cedar, western hemlock, and Sitka spruce, characterizes the forested wetlands. The trees appear stunted relative to those that are found in a forest with better drainage. The understory supports a dense growth of blueberry, huckleberry, rusty menziesia, salal, and an herb ground cover.

Palustrine, "muskeg"-type wetlands predominate west and south of the airport and on Pennock Island. These open wetlands are intricately interspersed with small patches of forested wetland. The open areas are characterized by low shrub and herb vegetation, such as sweetgale, blueberry, crowberry, and short sedges, and by water pooled on the surface. Typically, wetlands with such vegetation are associated with deep accumulations of peat. However, most of the open wetlands on Gravina Island are thought to contain only a shallow layer of organic matter over a mineral

soil. Many of the wetlands are moderately sloped and have water flowing through them. Flowing water, as well as contact between that water and mineral soil, usually leads to a more nutrient-rich and productive biological community. If these wetlands had deep peat, most of them would be categorized as "fens," which are less acidic and more nutrient-rich than "bogs." The term "fen" will be used loosely to describe these areas even though they do not have deep peat accumulations. Some true bogs, with deep deposits of peat and less flowing water, have been observed within the Ketchikan area.

Detailed information pertaining to wetlands in the Ketchikan Gateway Borough is available from the Preliminary Wetlands Analysis Memorandum prepared for the Gravina Access Project (Leggett 2000).

### Rocky Islands and Sea Cliffs

Rocky islands and sea cliffs are of volcanic or tectonic origin with rocky shores and offshore rocks, capes, and steep rock seafronts. They provide important haulout areas for seals and sea lions and invaluable habitat for waterfowl, shellfish, and microscopic marine life. The Ketchikan coastal district contains numerous rocky islands, reefs, and exposed rocks due to its location within the Alexander Archipelago.

Steller sea lions and harbor seals are the most frequent marine mammals in the marine waters of the district. The seal lions depend on the rocky coasts for haul out sites and the waterfront adjacent to the City of Ketchikan is their winter feeding habitat. The sea lion population is unstable and the species is officially designated as endangered by the National Marine Fisheries Service (NMFS).

Harbor seals also rely on the rocky coasts and islands where the females bear their pups. Harbor seals can be found in the Ketchikan coastal district as far north as Tatoosh Rocks off of Betton Island, south to Upper George Inlet Salt Lagoon, and Seal Tip, the southern tip of Gravina Island.

### Barrier Islands and Lagoons

Barrier islands do not exist within the Ketchikan coastal district.

A lagoon can be defined as an area of shallow salt water or estuary separated from the sea by sand dunes or islands with restricted water exchange to the sea. There are two notable lagoons in the Ketchikan coastal district: Roosevelt Lagoon at the mouth of the Naha River and the Salt Lagoon at the head of George Inlet. These lagoons provide habitat for anadromous fish and shorebirds, and are also of significance to deer, wolf, land (river) otter, and weasel winter habitat.

### Exposed High Energy Coasts

Exposed high-energy coasts are characterized by direct exposure to ocean waves and storm surges that result in an active surf zone and dynamic shoreline processes such as erosion and deposition. The Ketchikan coastal district is not susceptible to these intense, high-energy waves because it lies within the Inside Passage of Southeast Alaska and is sheltered by Prince of Wales Island. As the sea forces its way through the Tongass Narrows, high tides combined with high winds and storms can lead to episodes of intense coastal activity. Generally, the Ketchikan Gateway Borough coastal zone only experiences low to moderate intensity wave action.

## Freshwater Rivers, Streams, and Lakes

Freshwater rivers, streams, and lakes support a variety of fish and wildlife. Migratory birds and mammals use these waterways for food and many rear their young along these waterbodies. Anadromous and resident fish also use these waterways for spawning and migration. The Ketchikan Gateway Borough consists of numerous surface streams (Table 12-4) but, because the islands are not large enough to provide a sufficient watershed area, there are no notably large rivers found.

The Ketchikan commercial and sport fisheries largely depend on salmon. The Naha River is the most notable river for red salmon. Portage Creek, Traitors River, Carroll River, and White River are other major red salmon streams. Ward Creek flows from Talbot Lake, to Connell Lake and Ward Lake before emptying into Ward Cove, offering 4.2 acres of salmon spawning habitat. The Leask Creek drainage produces a significant amount of salmon and provides about 2.2 acres of spawning area. The Leask Creek/Lakes area is also a known bear concentration area. Moser Bay is a remote area on Revillagigedo Island, located approximately 17 air miles north of the City of Ketchikan and is noted for its physical and aesthetic attributes. About 1 mile north of Moser Bay is the entrance to the Naha River where there is an abundance of black bear and other wildlife.

**Table 9-4. Significant Lakes, Rivers and Streams**

| **Revillagigedo Island** | | |
|---|---|---|
| Basin Lakes | Cedar Lake | Emma Creek |
| Beaver Creek | Chamberlain Lake | Emma Lake |
| Big Lake | Claude Lake | Falls Creek |
| Bluff Lake | Connell Lake | First Waterfall Creek |
| Buckhorn Lake | Cow Creek | Fromholtz Creek |
| Calamity Creek | Ella Creek | Gokachin Creek |
| Carlanna Lakes | Ella Lake | Gokachin Lakes |
| Grace Creek | Lower Wolf Lake | Pine Lake |
| Gunsight Creek | Lunch Creek | Portage Creek |
| Heckman Lake | Mahoney Lake | Second Waterfall Creek |
| January Lake | Manzanita Creek | Snow Lake |
| Jordan Lake | Manzanita Lake | Swan Lake |
| Klam Creek | Marble Creek | Talbot Lake |
| Klu Creek | Margaret Creek | Third Lake |
| Lake Grace | Margaret Lake | Trap Lake |
| Lake Harriet Hunt | Mesa Lakes | Upper Ketchikan Lake |
| Lake Perseverance | Mirror Lake | Upper Mahoney Lake |
| Leask Creek | Naha River | Upper Silvis Lake |
| Leask Lake | Neets Creek | Ward Creek |
| Licking Creek | North Saddle Lake | Ward Lake |
| Long Lake | Orchard Creek | Whipple Creek |
| Lower Ella Lake | Orchard Lake | White River |
| Lower Ketchikan Lake | Orton Lake | Whitman Lake |
| Lower Silvis Lake | Patching Lake | Herring Creek |
| **Gravina Island** | | |
| Bostwick Creek | Government Creek | Vallenar Creek |
| Bostwick Lake | Lewis Creek | |

## Upland Habitat

The coastal, old-growth forests provide a diverse range of habitat types for a variety of upland species. The areas found below an elevation of 1,000 feet are the areas most likely to support upland habitat because these areas are less likely to be covered with snow during the winter season. The Sitka black-tailed deer are herbivores that feed on a wide variety of plant foods. Habitat for the deer ranges from the shoreline and beaches to open alpine areas. Throughout the winter, the majority of deer move up and down the mountain slopes, typically staying beneath the snowline. The Naha River, shoreline portions of George and Carroll Inlets, and Blank and Bostwick Inlets on Gravina Island and Betton Island are known winter concentration areas. These areas are usually at sea level on south facing slopes. Black bear are found throughout the entire area. The highest harvest of black bear appears to be at Carroll Inlet, George Inlet, the Revilla Road, and northwest Revillagigedo Island (Survey-Inventory Management Report 1995).

## Habitat Resource Analysis

*Present and Anticipated Needs.* Ketchikan's coastal area is rich in marine and upland habitats and resources. These natural resources provide for a variety of present and future needs and activities in the community. All of the eight habitat types regulated by the Alaska CMP are present within the Borough, with the exception of exposed high-energy coasts. Over 30 nearshore marine water areas (e.g., coves, bays, inlets, and narrows) surround Revillagigedo Island and 11 such areas surround Gravina Island. Estuaries occur along the shoreline of both islands. The various wetland types found throughout the Borough include lacustrine (lakes), palustrine (muskegs and bogs), riverine (rivers), and forested (needle-leaved evergreen) wetlands. Rocky island and sea cliff habitat are found throughout the Borough; a few examples are Upper George Inlet near Salt Lagoon, Tatoosh Rocks off of Betton Island, and Seal Tip south of Gravina Island. Such locations provide habitat and are also popular for wildlife viewing by the tourism and recreation sectors of the local economy. Roosevelt Lagoon and Salt Lagoon provide lagoon habitat for anadromous fish, shorebirds and terrestrial mammals, especially black bears. The upper George Inlet/Salt Lagoon area is also the setting for more than 200 subdivided recreational cabin sites. The abundance of marine waters, rivers, streams, and lakes in the Borough support a variety of fish and wildlife that are important to the visitor and commercial fisheries industries and to local subsistence and personal use activities. Ketchikan Creek, Ward Creek, Naha River, Portage Creek, Traitors River, Carroll River, and White River are some of the major salmon streams near Ketchikan. The coastal forests provide for many human uses as well as a range of habitat types for a variety of upland species and are important to many aspects of the Borough's economy including forestry and tourism.

Commercial, industrial, and residential development is limited, for the most part, to areas that are accessible by road along Tongass Narrows, Clover Passage, and George Inlet. Other areas, such as Moser Bay and upper George Inlet are reasonably accessible by skiff and this facilitates remote residential and recreational cabin development. Taken together, human activities and community growth have changed the character of this coastal habitat to varying degrees. Community growth and expansion will increase the need for land in areas of upland habitat especially along the eastern flank of Gravina Island as a result of improved access and along planned extensions to the current road system. However, many coastal habitat areas beyond the road system are in nearly pristine condition and are fully supportive of the wildlife and vegetation that rely on them.

*Direct and Indirect Impacts.* Several factors affect the supply and quality of the coastal habitats, including population growth, timber harvests, road system and other infrastructure expansion, and recreation and tourism development. Their likely direct and indirect impacts on each of the coastal habitats are as follows:

- Marine waters provide habitat for marine mammals, anadromous fish, marine fish, seabirds, shellfish, and marine plants and make important contributions to the health of the local economy and various community activities. The development of new marinas, for instance, is an identified need for commercial and recreational boats. Possible locations include the City of Saxman, Ward Cove, the East Channel of Tongass Narrows, and several sites along the eastern coast of Gravina Island. Harbor development has the potential to affect the habitat of nearby marine waters depending upon how and where they are developed. Gas and oil from boats moored and serviced at these sites can adversely impact marine waters and directly impact the commercial harvest of marine fish, shellfish, and mammals. Improving marine access to remote areas of the Borough by providing docks, buoys, and ramps can provide various recreational and commercial benefits. However, improved access can also increase hunting and fishing pressures in certain areas, and lead to secondary impacts on

important subsistence use areas, guiding services, and local hunters and fishers, thereby affecting both the cash and non-cash economy.

Although visitors and recreation users provide important economic benefits, they can also have a direct impact on coastal habitats by walking off designated trails, trampling on vegetation, littering, or disturbing wildlife. Tour boats engaged in up-close wildlife viewing can impact marine mammals and bird rookeries through unintentional harassment. In the long term, such impacts have the potential to diminish the economic value of the resources.

Nearshore areas, lagoons, and wetlands are also susceptible to ship pollution. Spills, leaks, or other emissions from marine vessels could directly impact these areas and affect coastal habitats, fish, wildlife, and vegetation in contact with that area. Effluent and waste from septic systems can also have a direct impact on water quality by polluting marine waters, wetlands, and coastal habitat.

- Estuaries such as those at Lewis Reef, Leask Cove, Bostwick Inlet, and Vallenar Bay, are important ecosystems. They support a variety of habitats and provide feeding areas for mammals such as deer, black bear, river otter, mink, shorebirds, waterfowl, songbirds, and many aquatic species. They also serve as rearing areas for fish. Development in estuarine environments, such as piers and houseboats, can alter the water chemistry and pollute the estuary without proper siting and mitigation measures. Estuarine development has the potential to take away shelter, nutrients, and food upon which many species of fish, shellfish, and shorebird populations depend. This can have an indirect adverse impact on deer, bear, and other terrestrial mammal populations that feed in estuaries.

  Poorly designed development activities upstream of an estuary can influence the productivity and water quality of the estuary. Runoff and sediments from construction can wash downstream, indirectly impacting the estuary and reducing habitat productivity. Hydroelectric projects can alter the flow of water and change the freshwater-saltwater chemistry in the estuary, which has the potential to affect productivity. These impacts, can in turn, affect commercial and non-commercial species of fish and shellfish.

- Some types of wetlands provide habitat to waterfowl, seabirds, spawning fish, deer, and bear. Due to their extensive occurrence in the Ketchikan area, they have been often been built upon to meet community land use needs. Most future community expansion will also take place within some type of wetland.

  Direct impacts to high value wetlands from fill can result in the reduction of habitat for plants and animals. Filling wetlands can have indirect impacts to wildlife populations because it reduces feeding and nesting areas.

  Wetlands are also important for the retention of floodwater, and the elimination of wetlands can cause flooding, which can possibly wash out development, or cause other impacts. Some wetlands, such as the watersheds in Saxman and the Mountain Point neighborhood, are areas of groundwater recharge and provide potable water supplies. These wetlands act as natural filtration systems by retaining sediments and diluting pollutants. Development in watershed areas can affect groundwater recharge and potable water supplies. The benefit of wetlands is that they provide these functions at low cost and can reduce the cost of development of flood control measures or water purification systems.

- Rocky islands and sea cliffs, such as the Tatoosh Islands, provide rookeries for birds, seals, and sea lions. While these areas are not typically suitable for development, they can be major tourist attractions. Improved accessibility to these areas can have a secondary impact on the species that inhabit them, which could indirectly affect tourism revenue. Fishing at or near sea lion haul outs increases competition for food. Steller sea lions are currently listed as endangered species. Reduction in populations of species that rely on these habitats could indirectly impact guiding and tour operators.

- Three notable lagoons are present in the Borough, Roosevelt Lagoon near Naha Bay, Salt Lagoon at the head of George Inlet, and Marguerite Bay, located in Traitors Cove. Impacting lagoons by fill or development can have direct and indirect impacts on anadromous fish, shore birds, deer, wolf, otters, and weasel that use lagoons for nesting or feeding. At the same time, the Salt Lagoon area is presently crossed by an existing route for the delivery of Swan Lake electricity and may also be passed by a future road to Shelter Cove on Carroll Inlet.

- The Borough's many freshwater rivers, streams, and lakes provide a variety of wildlife with food and also support commercial and recreational fishing. Many species rear their young along these waterways, and anadromous and resident fish use these waterways for spawning and migration. Improperly designed development near rivers, streams, or lakes, can have direct and indirect impacts on fish, including salmon. Impacts to salmon populations can have secondary impacts on commercial fisheries and sport-fish guides that largely depend on healthy salmon populations. Runoff, sedimentation, and alteration of flow dynamics are all factors that can impact salmon. A decrease in salmon populations also could adversely affect bear and other wildlife that feed on salmon and subsistence and personal use by local residents who rely on salmon as part of their diet.

  Many rivers, lakes, and streams offer recreation opportunities. Tourists and residents use these areas for sightseeing, kayaking, hunting and fishing. Development near some of these areas could affect the attraction of these areas to some types of visitors, having an indirect impact on an important sector of the Borough's economy or local resident recreation activities.

- Coastal forests, the Borough's dominant land form, provide a diverse range of upland habitat types for a variety of species and uses. Logging and other development in some upland areas can reduce animal habitat that provide species for sport hunters and subsistence users. Conversely, some development, such as logging, can create areas for younger vegetation and can increase populations of browse species, such as deer.

*Suitability and Sensitivity*. Coastal forests and their upland habitats comprise the majority of land available for community growth as well as an important industrial resource for timber products. However, development in some of these upland areas can be problematic especially in areas of steep terrain. While poorly designed development can increase the potential of landslides and erosion, many of these areas may still be suitable for timber harvest or other activities. The upland areas near the coast within the district tend to be the most suitable locations for residential and commercial development because the terrain is gently to moderately sloped and because marine access and transportation can be provided in areas beyond the road system. These areas, however, tend to be sensitive to development because of their proximity to shoreline habitats. Coastal forests also contribute to the setting and scenery enjoyed by local residents and expected by visitors. Properly designed logging and other development activities,

however, can coexist with habitat, scenery and other values important to local residents and industry.

River, stream, and lake systems are generally suitable for use by sport fishermen and personal use and subsistence users. Streams and rivers and the fish that they support are sensitive to erosion and the increased sediment load that improper development can cause. Poorly designed development, timber harvesting, or road construction, for instance, can impact the water quality or hydrology of water bodies and can impact aquatic life and the livelihood of people who rely on those resources.

Marine waters, estuaries, and lagoons are generally suitable for use by commercial fishing, sport fishing, tourism, and upland access, but are susceptible to pollution from runoff and boat emissions.

Due to the average rainfall of 148 inches, much of the Borough is regulated wetlands and development within them is inevitable. Some wetlands with important resource values can be adversely impacted by fill and development. Rocky islands and sea cliffs, which provide important rookeries for birds, seals, and sea lions, are most sensitive to disturbance by the wakes from ferries and cruise ships, and tour boat traffic.

*Conflicts Among Uses and Activities.* Because most of the Borough's developable land lies within coastal habitat areas, there is often competition for these resources among a variety of needs including community growth and habitat management. Effective management of the district's coastal habitats is important to clearly establish the rights of various activities that need these resources. For instance, it is anticipated that the community will continue development and redevelopment along the coastal road system. Although important habitat assets such as Ketchikan Creek and Ward Cove will be protected to the maximum extent feasible, there is a presumption that human needs along the road system will outweigh lower value or isolated habitats previously impacted by development. Where impacting a habitat in turn impacts the economic livelihood of another activity or a user of resources that depend on that habitat, conflict can occur. For example, Bostwick Inlet on Gravina Island is an important subsistence and recreation area and it is also strategically located for the removal of timber from the island. Use of barges for log transfer rather than log rafts in the area may achieve purposes for both conservation and timber harvest. Managing the use of such resources to the maximum benefit of all potential users is the responsibility of the district through its enforceable policies.

## Fish and Wildlife Resources Inventory

Numerous animal species inhabit the KGB. Table 9-5 identifies the most common species.

**Table 9-5. Major Animal Species Found Within Project Area**

| Terrestrial Mammals | Birds |
|---|---|
| • Alexander Archipelago (gray) wolf (*Canis lupus*) | • Pacific loon (Gavia pacifica) |
| • Beaver (*Castor canadensis*) | • Mew gull (*Larus canus)* |
| • Black bear (*Ursus americanis*) | • Herring gull (*Larus thayeri*) |
| • Deer mouse (*Peromyscus maniculatus*) | • Glaucous-wing gull (*Larus glaucescens)* |
| • Dusky shrew (*Sorex obscurus*) | • Common murre (*Uria aalge*) |
| • Land or river otter (*Lutra canadensis*) | • Marbled murlette (*Brachyramphus marmoratus*) |
| • Little brown myotis (bat) (*Myotis lucifugus*) | • Pelagic cormorant (*Phalacrocorax pelagicus*) |

- Long legged myotis (bat) (*Myotis longicaudus*)
- Meadow vole (*Microtus pennsylyanicus*)
- Mink (*Mustela vison*)
- Northern flying squirrel (*Glaucomys sabrinus*)
- Pine marten (*Martes americana*)
- Red squirrel (*Tamiasciurus hudsonicus*)
- Red-backed vole (*Clethrionomys rutilus*)
- Sitka black-tailed deer (*Odocoileus hemionus sitkensis*)

**Marine Mammals**

- Dall porpoise (*Phocoenoides dalli*)
- Harbor porpoise (*Phocoena phoecena*)
- Harbor seal (*Phoca vitulina richardsi*)
- Humpback whale (*Megapters novaeangliae*)
- Killer whale (*Orcinus orca*)
- Minke whale (*Balaenoptera acutorostrata*)
- Pacific white-sided dolphin (*Lagenorynchus obliquidens*)
- Steller's sea lion (*Eumetopias jubata*)

**Fish Species**

- Chinook salmon (*Onocorhynchus tshawytscha*)
- Chum salmon (*Onocorhynchus keta*)
- Coho salmon (*Onocorhynchus kisutch*)
- Cutthroat trout (*Salmo clarki*)
- Dolly Varden char (*Salvelinus malma*)
- Pink salmon (*Onocorhynchus gorbuscha*)
- Pacific halibut (*Hippoglossus stenolepis*)
- Pacific herring (*Clupea pallasii*)
- Sockeye or red salmon (*Onocorhynchus nerka*)
- Steelhead/rainbow trout (*Onocorhynchus mykiss*)
- Lingcod (*Ophiodon elongatus*)

- Canada goose (*Branta canadensis*)
- Mallard (*Anas platyrhynchos*)
- Old squaw (*Clangula hyemalis*)
- Surf scoter (*Melanitta perspicillata*)
- White-winged scoter (*Melanitta fusca)*
- Barrow's goldeneye (*Bucephala islandica*)
- Western grebe (*Aechmophorus occidentlis*)
- Bufflehead (*Bucephala albeola*)
- Common merganser (*Mergus merganser*)
- Common tern (*Sterna hirundo*)
- Bonaparte's gull (*Larus philadelphia)*
- Northwestern crow (*Corvus caurinus*)
- Common raven (*Corvus corax*)
- Varied thrush (*Ixoreus naevius*)
- Dark-eyed junco (*Junco hyemalis*)
- Red crossbill (*Loxia curvirostra*)
- Rock dove (*Columba livia*)
- Steller's jay (*Cyanocitta stelleri*)
- Chestnut-backed chickadee (*Parus rufescens*)
- Bald eagle (*Haliaeetus leucocephalus*)
- Black turnstone (*Arenaria melanocephala*)

Adapted from: Ketchikan Gateway Borough Planning Dept. 1994; Heinl and Goucher 2000; Heinl 2000

## Fish Resources

Southeast Alaska has many freshwater lakes, rivers, and streams along with thousands of miles of shoreline. Together, the fresh and marine waters support approximately 300 species of fish in about 65 families. This section identifies and describes some of the important anadromous and marine fish found in the Borough.

#### Anadromous fish

Fish that spend periods of their lives in fresh and salt water, or anadromous fish, flourish in Southeast Alaska. All species of salmon, cutthroat and steelhead trout, and Dolly Varden inhabit Southeast Alaska and provide food for bears, wolves, bald eagles, and other animals. In the district, anadromous fish are also valuable to commercial, resident, and visiting sport fishers.

All five species of salmon are found in the Borough. After maturing for several years in the Gulf of Alaska they return to spawn in many of the streams in the coastal district. Nearshore areas also provide important rearing habitat for juvenile salmon. The pink and chum salmon, the most stable in population, favor the miles of rugged coastline for spawning.

Pink salmon spawn in many of the creeks in the Borough. Adult pink salmon enter spawning streams in the Borough between late June and mid-October. Most pink salmon spawn within a few miles of the coast or within the intertidal zone of the mouth of streams and die soon afterward. In late winter or spring, the fry swim up out of the gravel and migrate downstream into salt water. Juvenile pink salmon then move along the beaches in dense schools near the surface, feeding on plankton, larval fishes, and occasionally insects (ADF&G 1999e). In the vicinity of Ketchikan, the ADF&G has performed counts of pink salmon to show the magnitude of the pink salmon populations in the Tongass Narrows. ADF&G recorded 6,550 pinks in Ward Creek in August 1998, 180,500 pinks in Ketchikan Creek in September 1996, 490 pinks in Carlanna Creek in September 1979, 2,600 pinks in Hoadley Creek in September 1999, 5,000 pinks in Lewis Reef Creek in August 1983, and 3,000 pinks in Whipple Creek in August 1988 (ADF&G 2000b). [Note: These fish counts do not represent a "peak" count for the year they were surveyed, only the number observed on the day of the survey.]

Chum salmon spawn in many of the same places as pink salmon. In the vicinity of Ketchikan, chum salmon spawn from mid-June to mid-November in Government Creek, Ward Creek, Ketchikan Creek, Carlanna Creek, and Lewis Reef Creek. Chums feed on small insects in the streams and estuaries before joining schools in salt water where their diet usually consists of zooplankton. By autumn, they move out to the Gulf of Alaska and spend one to six winters there. In southeastern Alaska, most chum salmon mature at 4 years of age, although considerable variation in age at maturity exists between streams (ADF&G 1999e). Snapshot counts completed by ADF&G recorded 400 chums in the Ward Creek in August 1998, 500 chum in Ketchikan Creek in September 1996, 6 chum in Carlanna Creek in September 1969, and 200 in Lewis Reef Creek in August 1983 (ADF&G 2000b). [Note: These fish counts do not represent a "peak" count for the year they were surveyed, only the number observed on the day of the survey.]

Coho salmon spawn and rear in most of the longer creeks in the Ketchikan area, and natural runs in Ketchikan and Ward Creeks are hatchery enhanced (Table 12-6). Coho enter and spawn in streams from mid-June through mid-November during periods of high runoff. The eggs develop during the winter, hatch in early spring, and the embryos remain in the gravel utilizing the egg yolk until they emerge in May or June. Coho spend one to three winters in project area streams before migrating to the sea as smolt. Time at sea varies. Some males (called jacks) mature and return after only six months at sea at a length of about 12 inches, while most fish stay 18 months before returning as full size adults (ADF&G 1999e). ADF&G counts show the significance of coho salmon in the project area: 1,000 coho were in Ketchikan Creek in December 1985 and 1,550 were in Ketchikan Creek in September 1983.

Adult Chinook salmon spawn and rear in Ketchikan Creek and Herring Cove. Additionally, Deer Mountain Tribal Hatchery enhances the Chinook and coho salmon run in the creek (Table 12-7). Although total escapement has not been calculated, ADF&G recorded 1,433 Chinook in Ketchikan Creek in September 1983 (ADF&G 2000e). The fish return to Ketchikan Creek from mid-June through mid-August to spawn. Eggs hatch in late winter or early spring and juveniles remain in fresh water feeding on plankton and insects until the following spring when they migrate to the ocean. Chinook salmon spend one to seven years in the ocean eating a variety of organisms including herring, pilchard, sandlance, squid, and crustaceans.

ADF&G counted approximately 175 sockeye salmon in Ward Creek in October 1988. Sockeye return to Ward Creek to spawn in July and August after spending one to four years in the ocean. After hatching, juveniles usually spend one to three years in Ward Lake before migrating to the ocean in the spring.

Steelhead trout (*Salmo gairdneri*) are rainbow trout that spend a part of their life in the sea. According to ADF&G Sport Fish Division snorkel counts, Ketchikan and Vallenar Creeks have steelhead runs of 250 to 500 and 200 to 300 fish, respectively. ADF&G estimates that Ward Creek has runs with approximately 200 steelhead (Hoffman 2000). Bostwick Creek has a steelhead run with unknown numbers. Unlike salmon, steelhead spawn more than once, and fish over 28 inches are almost always repeat spawners. Peak adult steelhead migration into the area creeks occurs in November and December. Spawning commences in March and adults return the ocean in April and May. Generally, the juvenile steelhead will remain in the parent stream for about 1 to five years before outmigrating to salt water. Juvenile fish move to salt water in May to mid-July, depending on the watershed (Hoffman 2000).

Ketchikan Creek has an anadromous cutthroat trout population and Ward Creek has resident and anadromous cutthroat trout populations. Anadromous cutthroat come into the creek in the fall, overwinter, and sometimes stay through the spring. The juvenile fish hatch from the gravel in February. According to ADF&G, resident fish can reach 18 to 22 inches at their largest and live to be 18 to 24 years old. The cutthroat fishery primarily is comprised of local fishers and is mainly catch and release (Hoffman 2000). Additionally, in anadromous stream mapping, ADF&G identifies Dolly Varden populations in Ward Creek. However, little information exists regarding the species.

On Revillagigedo Island, the Southern Southeast Regional Aquacultural Association, Inc. (SSRAA) operates the Whitman Lake Hatchery on the Ketchikan roadway system and Neets Bay Hatchery at a remote location on Behm Canal. Funded by regional commercial fishers, the SSRAA hatchery operations are designed to supplement wild Chinook, chum, and coho salmon populations. The Deer Mountain Tribal Hatchery raises and releases anadromous fish into Ketchikan Creek, Ward Lake, and others. *Table 9-6* shows the numbers of fish released into Borough waterways from these hatcheries. *Table 9-7* shows significant locations of freshwater fish in the Ketchikan area.

**Table 9-6. 2004 Fishery Enhancement Activities in the Ketchikan Area**

| Release Location | Species | Number released |
|---|---|---|
| Deer Mountain Hatchery | | |
| Ketchikan Creek | Chinook salmon | 85,948* |
| Ketchikan Creek | Coho salmon | 75,299* |
| Ward Lake | Coho salmon | 76,094* |
| Ketchikan Creek | Steelhead trout | 0* |
| Whitman Lake Hatchery | | |
| Herring Cove | Chinook salmon | 720,000** |
| | Coho salmon | 158,000** |
| Neets Bay Hatchery | | |
| Neets Bay | Chinook salmon | 500,000** |
| | Coho salmon | 2,500,000** |
| | Summer chum salmon | 48,000,000** |
| | Fall chum salmon | 17,000,000** |

*2004 estimates of numbers of fish released

**2004 estimates of fish released

Source: Guthrey 2000; SSRAA

**Table 9-7. Significant Locations of Freshwater Fish**

| *Body of Water* | *Chum salmon* | *Coho salmon* | *King salmon* | *Pink salmon* | *Sockeye salmon* | *Brook trout* | *Cutthroat trout* | *Dolly varden/ Char* | *Rainbow trout* | *Steelhead* | *Grayling* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carroll Creek | √ | √ | | √ | | | √ | √ | | √ | |
| Connell/Talbot Lakes | | | | | | | √ | √ | | √ | |
| Lake Harriet Hunt | | | | | | | | | √ | | |
| Ketchikan Creek | √ | √ | √ | √ | | | √ | √ | √ | √ | |
| Manzanita Lake System | √ | √ | | √ | | | √ | √ | | | |
| Naha River System | √ | √ | | √ | √ | | √ | √ | √ | √ | √ |
| Orchard Lake | | | | | | | √ | √ | | | |
| Perseverance Lake | | | | | | √ | | | | | |
| Swan Lake | | | | | | | | √ | | | |
| Ward Lake System | √ | √ | | √ | √ | | √ | √ | √ | √ | |

Source: DeLorme Mapping, 1992

**Marine Fish**

While southeastern Alaska rivers and streams have relatively few species of resident fish, marine waters contain hundreds of fish species. Flatfish, cod, rockfish, sculpin, skate, and sablefish are abundant in the marine waters throughout Southeast Alaska. Additionally, huge schools of herring, smelt, capelin, and Pacific sand lance collectively provide the food base for salmon, trout, and char (O'Clair et al. 1997). This section gives detail of marine fish identified by ADF&G and the National Marine Fisheries Service (NMFS) as important.

Pacific herring (*Clupea pallasi*) and their eggs are important food sources for a wide variety of fishes, mammals, and birds. Additionally, humans harvest herring eggs for consumption (commercial and subsistence). Near Ketchikan, herring spawn during the spring in eelgrass or *Fucus* beds at Totem Bight, Herring Bay, Mountain Point, and the north end of Gravina Island (Ketchikan Gateway Borough 1994; Heinl 2000). The West Behm herring, ages three to seven years, spawn on or around Gravina Island from South Vallenar Point to Rosa Reef throughout the month of April (Walker 2000).

Herring eggs are adhesive, and survival is better for those eggs that stick to intertidal vegetation than for those that fall to the bottom. Following metamorphosis of the larvae to the juvenile form, they rear in sheltered bays and inlets and appear to remain segregated from adult populations until they are mature. After spawning, most adults leave inshore waters and move offshore to feed primarily on zooplankton such as copepods and other crustaceans (ADF&G 1999e); however, some herring concentrate near the mouth of Ward Cove in the winter (Ketchikan Gateway Borough 1994).

The state's limited entry program regulates harvest for herring sac roe in Southeast Alaska (ADF&G 1999e). The closest commercial herring sac roe fishery to the Ketchikan area is in Revillagigedo Channel. In a 7.5-hour herring sac roe fishing opening on April 1, 1998, 87 permitted operators caught 620 tons of herring (ADF&G 1999a). However, no openings occurred in 1999 because of low numbers (ADF&G 2000).

Pacific halibut (*Hippoglossus stenolepis*) inhabit marine waters of the Borough. Based on sport fishing catch information, most halibut in the Ketchikan area measure 65 to 105 centimeters (cm)

and weigh between 15 and 24 pounds (ADF&G 1999b). Halibut eat a large variety of fishes, including cod, turbot, pollock, and some invertebrates such as crab and shrimp, and sometimes leave the ocean bottom to feed on pelagic fish, such as sand lance and herring. The fish spawn in the winter months. Free-floating eggs and larvae float for up to six months until they are carried to shallower waters by prevailing currents to begin life as bottom dwellers. Older fish often use both shallow and deep waters over the annual cycle; however, they have much smaller "home ranges" than halibut younger than 10 years (ADFG 1999e).

Other marine fish species that live in the marine waters of the Ketchikan Gateway Borough include yelloweye rockfish, shortracker, rougheye rockfish, dusky rockfish, walleye pollock, sablefish, lingcod, Pacific Ocean perch, arrowtooth flounder, Pacific cod, skates, and sculpin (Shaw 1999) (Table 9-8).

**Table 9-8. Significant Locations of Marine Fish**

| *Body of Water* | *Chum salmon* | *Coho salmon* | *King salmon* | *Pink salmon* | *Halibut* | *Rockfish* | *Dolly varden* | *Flounder/ Sole/Other* |
|---|---|---|---|---|---|---|---|---|
| Carroll Inlet | √ | √ | √ | √ | √ | √ | √ | √ |
| Carroll Point | | √ | √ | √ | √ | √ | √ | √ |
| Clover Passage | √ | √ | √ | √ | √ | √ | √ | √ |
| Herring Bay | √ | √ | √ | √ | | | √ | |
| Neets Bay | √ | √ | √ | √ | √ | √ | √ | |
| Point Alava | √ | √ | √ | √ | √ | √ | √ | |
| Vallenar Point | √ | √ | √ | √ | √ | √ | √ | |
| Mountain Point | √ | √ | √ | √ | √ | | √ | |

Source: DeLorme Mapping, 1992

## Wildlife Resources

Approximately 50 species of terrestrial mammals inhabit the USFS's Tongass National Forest and most of southeastern Alaska (USFS 1997). Numerous species, including Sitka black-tailed deer, black bear, mink, beaver, and river otters, contend with heavy rains, deep winter snows, geographical barriers, such as mountains, larger rivers, and wide marine channels, that limit the distribution of terrestrial mammals in Southeast Alaska. They feed and breed in coastal rain forests, salt and freshwater wetlands, and alpine areas. While much information exists on larger land mammals, the exact distribution and numbers of many small mammals remains unknown.

### Land Mammals

***Sitka Black-Tailed Deer.*** The Sitka black-tailed deer (*Odocoileus hemionus sitkensis*) is native to wet coastal rain forests of Southeast Alaska and north-coastal British Columbia. Deer populations in Alaska are dynamic and usually fluctuate with the severity of the winters. Periodically, a severe winter will cause a major decline in the population (Ketchikan Gateway Borough 1994). However, unlike other areas in Alaska, the Ketchikan area rarely experiences severe winters resulting in high winter deer mortality (Person 2000). Since the 1980s, deer populations on Gravina Island have fluctuated between 350 and 915. Based on pellet group density counts and reports from hunters, the deer population inhabiting Gravina Island and South Revillagigedo Island is estimated at approximately 14 to 43 deer per square mile (ADF&G 1998a).

Critical habitat for deer is winter habitat. Winter habitat includes south and west-facing slopes not exceeding 800 ft and high volume timber stands (Person 2000). In the winter, they eat evergreen forbs and woody browse. During periods of deep snow (greater than 12 inches), deer rely on understory vegetation species including woody browse such as *Vaccinium* sp. (blueberry), evergreen forbs (like bunchberry and golden thread), yellow cedar, hemlock, and arboreal lichens. Often deer will move to the shoreline to feed on grasses and sedges (ADF&G 1999a). Deer may feed on *Fucus* and kelp; however, the animals receive little nutritional value from the algae. Evergreen forbs such as bunchberry and trailing bramble are the preferred food for deer when snow is not a problem. During summer, deer generally feed on herbaceous vegetation and the green leaves of shrubs away from the coastline.

The deer population on Gravina Island provides food for wolves and bear. Additionally, because of the close proximity to Ketchikan, Gravina Island is a popular deer hunting area. People access Gravina Island by boat or the airport ferry and travel around the island on foot. The middle of the Island provides a refuge for deer from hunters, since it is a long and difficult way to travel from the beach landings (Person 2000). The ADF&G manages deer hunting on Gravina Island, and assumes the residing population size is healthy (ADF&G 1998a).

***Alexander Archipelago Wolf.*** In Southeast Alaska, the wolf population varies closely with Sitka black-tailed deer. The wolves were petitioned for the federal list of threatened and endangered species as an endangered species in 1994, however, due to changes in forest harvest management and practices in the Tongass National Forest, the U.S. Fish and Wildlife Service (USFWS) denied the petition (ADF&G 1999c; Brown 2000; Grossman 2000; Person 2000).

According to the ADF&G, one pack of Alexander Archipelago wolf (*Canis lupus*) with 10 to 12 individuals inhabited Gravina Island in the fall of 1999, and approximately four wolves were shot or trapped during the following season (Person 2000). The ADF&G does not know whether the pack is restricted to Gravina Island or whether these wolves travel to Revillagigedo Island. Deer comprise 80 percent of the diet of wolves on Gravina Island, and the wolf pack is healthy because of the stable deer population there. The wolves also feed on beaver (15 to 20 percent of their diet), salmon, and occasionally scavenge or hunt marine mammals (Person 2000). They use a variety of habitats, including open wetlands and forests to hunt. Areas inhabited by their prey species are critical to the wolves' survival. Southeast Alaska's wolf populations may be vulnerable to access and road development (Person 2000; Grossman 2000).

***Black Bear.*** The population of black bear (*Ursus americanus*) in the Ketchikan Gateway Borough is approximately 1.5 black bear per square mile (ADF&G 1995). Black bears mainly inhabit forests but, depending on the season of the year, they may live in areas from sea level to alpine. Black bears are opportunist feeders that feed on freshly sprouted green vegetation in the spring and salmon during the summer and fall. Berries, especially blueberries, are an important late summer-fall food item. Black bears hibernate during the winter months in rock cavities, hollow trees, and self-made excavations located from sea level to alpine (ADF&G 1999e).

The ADF&G commonly relocate black bears from locations in the Ketchikan Gateway Borough to other areas in southern Southeast Alaska because of problems with human-bear interactions (Porter 2000). Humans hunt black bear on Gravina and Revillagigedo Islands. Based on hunter reports, an average of 66 bears per season were harvested from 1984 through 1992 and 43 bears per season were harvested from 1993 through 1995. ADF&G believes that early forest successional changes caused by logging may increase food for bears in the short-term. However,

the agency anticipates reductions in bear numbers as later forest growth results in less food and fewer places for bear to den (ADF&G 1995).

#### Marine Mammals

Many tourists visit Southeast Alaska to view the abundant populations of marine mammals. The National Marine Fisheries Service (NMFS) observed eleven species of marine mammals throughout Southeast Alaska during observations from Alaska State Ferries over five seasons. The most common sightings were humpback whales, killer whales, and Pacific white-sided dolphins (Mizroch et al. 1998).

Approximately eight species of marine mammals are found in the Ketchikan area. Harbor seals *(Phoca vitulina richardsi)* and Steller sea lions *(Eumetopias jubata)* inhabit Tongass Narrows year round. Additionally, humpback whale *(Megapters novaeangliae)*, killer whale *(Orcinus orca)*, Dall porpoise *(Phocoenoides dalli)*, Pacific white-sided dolphin *(Lagenorynchus obliquidens)*, minke whale *(Balaenoptera acutorostrata)*, and harbor porpoise *(Phocoena phoecena)* travel through the area (Frietag 2000, City of Ketchikan 1994). Grey whales are sometimes observed in the area-off Vallenar Point and one California elephant seal was seen in Behm Canal.

***Steller Sea Lion.*** Annual counts of sea lions between 1985 and 1990 indicated that populations in Tongass Narrows are large and stable (Montgomery Watson 1994). In the Narrows, sea lions feed on heavy concentrations of herring, crab, and rockfish along the waterfront adjacent to the City of Ketchikan (Ketchikan Gateway Borough 1994; Freitag 2000). However, no sea lion haulouts exist in the immediate Ketchikan area (Frietag 2000).

***Harbor Seal.*** Based on three aerial survey routes of terrestrial haulouts near Ketchikan, Sitka, and in Glacier Bay, the relatively abundant population of harbor seal in Southeast Alaska appears to be increasing or stable in recent years (Small 1998). Harbor seals inhabit Tongass Narrows, including the waterfront area adjacent to the City of Ketchikan, year round (Montgomery Watson 1994). They feed on pelagic and bottom fishes, crustaceans, and octopus (Lowry and Frost 1981).

### Birds

More than 300 bird species spend some period of time in Southeast Alaska, and 160 species nest in the region (O'Clair et al 1997). Around Revillagigedo and Gravina Islands and the surrounding waters, local bird watchers and naturalists have observed approximately 225 species of birds (Heinl and Goucher 2000). The birds inhabit a variety of habitats including marine waters, freshwater wetlands, and forests at various times of the year.

Numerous species forage in the rocky intertidal habitat of the planning area. Waterfowl, including oldsqaw, bufflehead *(Bucephala islandica)*, common goldeneye (*Bucephala clangula*), Barrow's goldeneye *(Bucephala islandica)*, harlequin duck (*Histrionicus histrionicus*), white-winged scoter (*Melanitta fusca*), surf scoter (*Melanitta perspicillata*), common merganser *(Mergus merganser)*, and red-breasted merganser *(Mergus serrator)*, forage in the rocky intertidal zone of the Tongass Narrows during high tide (O'Clair and O'Clair 1998; Heinl 2000). They primarily feed on invertebrates and small fish in the ice-free waters along the coastline during the winter and breed in more northern areas of Alaska during the summer. Other species, primarily gulls, northwestern crows (*Corvus caurinus*), and common ravens (*Corvus corax*), feed on various invertebrates and opportunistically scavenge in the rocky intertidal areas during low tide.

In the early spring, surf scoters and gulls, along with other species, gather and feed upon herring spawn on eelgrass and *Fucus*. Popular feeding areas include the Totem Bight area and the north end of Gravina Island. Gulls follow herring as they move northward along the coastline (Heinl 2000).

Some migratory waterfowl and summer seabirds concentrate just north of Pennock Island adjacent to downtown Ketchikan and at the head of Ward Cove (Ketchikan Gateway Borough 1994). Shorebird species, including western sandpipers (*Calidris mauri*) and red-necked phalarope (*Phalaropus fulicaria*), feed and stage in estuarine areas during the spring and fall migrations. Larger estuaries on Gravina Island provide important habitat to birds migrating northward (Heinl 2000). Since most seabirds feed and nest near the open ocean, seabird colonies do not exist within the district (Brockman 2000; Brown 2000; Heinl 2000; USFWS 2000).

Rock doves (*Columba livia*), chestnut-backed chickadees (*Parus rufescens*), winter wren (*Troglodytes troglodytes*), and varied thrush (*Ixoreus naevius*) breed and inhabit forested areas of the Ketchikan Gateway Borough year round. Other passerines, including Swainson's thrush (*Catharus ustulatus*), orange-crowned warbler (*Vermivora celata*), and Townsend's warblers (*Dendroica townsendi*), breed in the area forests in the summer. American robin (*Turdus migratorius*), dark-eyed junco (*Junco hyemalis*), kinglet (*Regulus* spp.) Steller's jay (*Cyanocitta stelleri)*, and several warblers (family Emberizidae) use beach-fringe forests and scrub-shrub communities. Greater yellowlegs (*Tringa melanoleuca*) may nest in the freshwater fens (Nickles 1997).

***Bald Eagles.*** Likely due to their protection under the Bald Eagle Protection Act of 1940 (as amended), the bald eagle *(Haliacetus leucocephalus)* population in Southeast Alaska is stable (Ketchikan Gateway Borough 1994). The Audubon Christmas Bird Count identified 53 bald eagles in the Ketchikan area in December 1999.

### Amphibians

Most amphibians in Southeast Alaska occur on the mainland within major river valleys. However, the rough skinned newt and the western toad inhabit the Borough. These species have been observed on Annette Island and by USFS representatives on Gravina Island (Brown 2000; Reich 2000a).

The rough skin newt salamander (*Taricha granulosa*) is reported to range on the Pacific coast of North America from northern California to southern Southeast Alaska. The newts are common on Annette Island in creeks and wet areas (Wake 1998) and were observed in the Mahoney Lake Hydroelectric Project area on Revillagigedo Island by HDR Alaska, Inc. in 1995. Rough skinned newts have a mean total length of 12 cm and width of 1.2 cm. The species is characterized by having dark blocking on its dorsal side.

The western or boreal toad (*Bufo boreas*) is common in southeastern Alaska and has been seen at night on roads in disturbed areas outside Ketchikan Gateway Borough, and anecdotally observed at Ward Lake (Wake 1998). The toad is characterized by rough, warty skin with glands that secrete a fluid to discourage predation. Adult toads may reach a length of approximately 3.5 inches. They breed in freshwater wetlands and move to terrestrial, non-forested areas to feed on insects and other small animals during adulthood (ADF&G 1999).

### Protected Species

Currently, the USFWS asserts that there are no listed species under their jurisdiction in the Ketchikan Gateway Borough (Woods 2000). The NMFS lists two species found in the Borough as endangered: Steller sea lion (*Eumetopias jubatus*) and humpback whale (*Megaptera novaeangliae*). Both species are additionally protected under the Marine Mammal Act of 1972.

The largest Steller sea lion rookery in the world is found in Southeast Alaska on Forrester Island. The Steller sea lions use approximately 50 haulout sites scattered throughout the coast of Southeast Alaska (MacDonald and Cook 1999), including one on the west side of Gravina Island in Clarence Strait.

North Pacific humpback whales were listed as endangered in 1966. It is estimated that 15,000 humpback whales inhabited the North Pacific prior to mechanized commercial whaling. Today, scientists estimate approximately 2,000 humpback whales in existence. More than 500 humpback whales inhabit the marine waters near Southeast Alaska during the summer (MacDonald and Cook 1999). Humpback whales commonly feed throughout the marine waters in the Ketchikan Gateway Borough. A few species in the district are protected by state and federal threatened and endangered species regulations (*Table 9-9*).

**Table 9-9. Federal and State Listed Threatened, Endangered, and Species of Special Concern that may be Found in the Borough**

| | Federal | State |
|---|---|---|
| Humpback whale | Endangered Species | Endangered Species |
| Steller sea lion | Endangered Species | Species of Special Concern |
| American peregrine falcon | | Species of Special Concern |
| Northern goshawk | | Species of Special Concern |
| Harbor seal | | Species of Special Concern |
| Marbled murlette | | Species of Special Concern |

Source: Alaska Department of Fish and Game. State of Alaska Endangered Species List. State of Alaska Species of Special Concern as of January 21, 2000; U.S. Fish and Wildlife Service Division of Endangered Species U.S. Listed Vertebrate Animal Species Index by Lead Region and Status as of January 31, 2000; personal communication with ADF&G, USFWS, NMFS, and USFS personnel.

## Fish and Wildlife Resources Analysis

*Present and Anticipated Needs.* Many species of anadromous fish, including all salmon species, cutthroat and steelhead trout, and Dolly Varden, inhabit Southeast Alaska. In the Ketchikan region, anadromous fish are economically valuable to resident and visiting fishers for commercial, sport and subsistence use. The marine waters of Southeast Alaska also contain hundreds of other fish species. Flatfish, cod, halibut, Pacific herring, and skate are just a few of the abundant species in Ketchikan's marine waters. Approximately 50 species of terrestrial mammals inhabit the Tongass National Forest and most of southeastern Alaska (USFS 1997), many of which are used for subsistence and sport hunting. Approximately eight species of marine mammals are found in the Ketchikan area; harbor seals and Steller sea lions inhabit Tongass Narrows year round while others travel through the area. Birds inhabit a variety of habitats including marine waters, freshwater wetlands, and forests at different times of the year. Two amphibian species also inhabit the Borough: the rough skinned newt salamander and the western toad.

Fish and wildlife resources account for a substantial part of economic activity in the community. The resources provide direct employment for approximately 700 people in commercial fishing

(1997), seafood processing directly employs 1,200 people during the peak season (1996-1998) and additional support service employment for others out of an average overall annual employment of 7,000 jobs. In addition, the resources provide additional revenue as a result of the more than 80,000 annual sport fishing trips (1997).

*Direct and Indirect Impacts*. Development, if properly designed and managed, can avoid direct and indirect impacts on the future availability of fish and wildlife resources for multiple users. The increased sediment load from runoff and direct impacts on anadromous and resident fish can be avoided at properly managed logging sites and from well-designed road building activities. (It should be noted that the potential direct and indirect impacts of timber harvest activities are reviewed and managed pursuant to the Alaska Forest Resources and Practices Act and not through local review.) The direct and indirect impacts from other types of development to terrestrial mammals and fish could have indirect impacts on commercial fishing, hunters, subsistence users, tourists, and recreation uses which, in turn, could have secondary impacts on the economy of the Borough. Development of coastal areas and upland forests can displace mammals from these locations, which could have an indirect impact on the economic sectors of tourism, commercial fishing, and recreational hunting and fishing. Filling high-value wetlands can impact salmon or important bird nesting areas and should be avoided. Tourism and recreation activities can have a direct impact on both marine and land mammals by disturbing seal and sea lion haul out sites and unintentionally harassing fish and wildlife. Disturbing fish and wildlife can impact the users who depend on these resources for food or income.

*Suitability and Sensitivity*. Fish and wildlife populations in the Borough are suitable for multiple uses including commercial, sport, and subsistence harvest as well as for viewing by visitors. Fish and wildlife resources, however, can be sensitive to pressures such as over-fishing or over-hunting and increased human presence. Fish, birds, and marine and land mammals also tend to be sensitive to noise, which can cause them to move away from their feeding or nesting areas. Tour boats and tourist activities can cause noise that is disruptive to wildlife. Seals and sea lions may avoid haul out sites, such as the one at the Tatoosh Islands, if tour boats are disturbing the area by approaching too closely.

Development activities can also impact habitats that support fish and wildlife upon which many sectors of the economy depend. Salmon and their eggs, for instance, are sensitive to sediment, and runoff. Impacts to salmon streams from development could reduce the availability of habitat important to commercial fish harvest.

*Conflicts Among Uses and Activities*. Sport fishing and hunting can also put pressure on fish and wildlife populations that could conflict with traditional commercial and subsistence harvest areas. Tourist activities can also disturb wildlife and marine fish and mammals causing conflicts between the tourism industry and resident hunters and subsistence users. Conversely, over-fishing or -hunting of resources upon which the tourism or recreation industries depend can cause economic impacts to these industries. If not well planned, development and road construction, near or in important stream or forest habitats, can conflict with use of these areas by hunters, subsistence users, and the tourists by eliminating or reducing fishing and hunting sites or scenery.

# Air, Land, and Water Quality

## Resource Inventory

### Air Quality

Ketchikan's open marine geography combined with strong winds, contribute to the area's excellent air quality. However, some facilities in the Ketchikan area (e.g., wood stoves and cruise ships) can seasonally contribute pollutants to the air and can adversely affect ambient air quality on microscale or middle scale (Heffern 2000).

The DEC conducted ambient air quality monitoring for particulate matter in the Bear Valley area of Ketchikan during the winters from November 1993 through February 1995. The DEC measured particulate matter with a size of 10 micrometers or less, or PM10 (DEC 1996). Monitoring efforts during the wood smoke season (December/January) showed that air quality in Bear Valley degrades during periods of wintertime inversions. The highest PM10 concentration ranged from 56 micrograms per cubic meter ($\mu g/m^3$) to 86 $\mu g/m^3$ and sometimes lasted for days. However, the data collected indicate that levels of particulate did not approach or exceed the National Ambient Air Quality Standard (NAAQS) for PM10 (DEC 1996). Currently, DEC monitors for PM2.5 wood smoke impacts in Bear Valley. No violations of the NAAQS have been observed.

Cruise ships are sources of marine fuel combustion and, as such, are a source of air pollution. Fuel burned in ship boilers and generators produce a variety of air pollutants, including nitrogen oxides (NOx), sulfur dioxide ($SO_2$), carbon monoxide (CO), and particulates. The Alaska Air Quality Control Plan places restrictions on the density of smoke, or "opacity" that any marine vessel can emit from its smokestacks. In general, if a ship is stationary at dock, it cannot have an opacity level greater than 20 percent, except for 3 minutes in any one-hour period (Pavitt 2000).

The EPA also conducts air quality emission measurements of cruise ships in southeastern Alaska. The EPA, actively investigating alleged Clean Air Act violations by cruise line companies in April 2000, was unable to release the air pollution measurements recorded (Pavitt 2000). Approximately 450 cruise ships dock at the Ketchikan dock between May and September (Glosten 1999).

### Water Quality

The DEC placed Ward Cove on the water quality-impaired water bodies list, or the Section 303(d) list, for sediment, dissolved oxygen (DO), color, and toxic substances in 1994. The DEC removed color from the listing in 1997. The studies showed that bottom sediments and accumulations of decomposing wood debris generate hazardous substances that are toxic to benthic organisms, and contribute to seasonal depressions in DO. August 1998 water sampling completed in Ward Cove showed severe depressions in DO. At one sampling location, the layer of water that was below Alaska water quality criteria for DO was up to 30 meters deep (DEC 1998).

Seafood processing plants in the Ketchikan Gateway Borough have the potential to impact marine water quality. Four seafood processors (Alaska General Seafoods, Trident Seafoods, E.C. Phillips, and Norquest) have fish waste outfalls adjacent to their facilities that discharge into deeper waters in Tongass Narrows. Processors discharge under a National Pollution Discharge Elimination System (NPDES) general permit for Alaskan shore-based seafood processors regulated by the EPA. Under permit requirements, the discharge outfalls are situated in

continually flushed underwater areas. The processors must perform dive surveys at the outfall area approximately each year, depending on the amount of discharge (Caroll 2000).

Residential, commercial, and emergency water sources outside the city-limits generally consist of small community water treatment and distribution systems, individual systems with ground water wells, individual treatment systems utilizing a surface water intake or rain catchment system, or individual holding tank systems with trucked water delivery. Groundwater within the Borough is very limited and many ground water sources may be subject to contamination from surface water sources because of shallow ground water depths or inadequate surface soils. Wastewater treatment and disposal in the Borough consists of small community systems with ocean outfalls, individual septic tanks with subsurface drainfields or ocean outfalls, and secondary wastewater treatment systems with drainfields and outfalls. Individual homes located along the waterfront can more easily utilize individual ocean outfall discharge, while the majority of the homes located in the upland areas must use subsurface drainfields to discharge sewage effluent or be connected to secondary wastewater treatment systems.

The State of Alaska, has recently taken the lead on discussions with the cruise ship industry and the state and federal agencies concerning waste management and disposal practices of cruise ships while in state waters. The discussions will result in a determination of discharge rates, types, and areas within Southeast Alaska. Additionally, DEC will attempt to work with the industry on volunteer mitigation of suspected problems or if necessary, enforceable regulations (Rodgers 2000). According to 40 CFR 122.3 (a), discharges of (treated) sewage, effluent from properly functioning marine engines, laundry, shower, and galley sink wastes ("greywater"), or any other discharges "incidental to the normal operation of a vessel," are exempt from the requirement to obtain a NPDES permit.

See Figures 13.1 and 13.2 for air, land, and water quality issues for the north and south Ketchikan areas.

### Water Facilities Resource Inventory

KPU provides potable water to developed areas within the City of Ketchikan, with a few exceptions, and to Ketchikan International Airport (KIA). With the exception of several neighborhood waterworks, individual home collection systems provide drinking water for other areas in the Borough, mostly through roof catchment.. During dryer months, tanker trucks transport and deliver the water supply. The KPU system has the capacity to meet the needs for regional water supply demand, but does not have a distribution network established to handle the volume and pressure loads a regional system would require.

Ketchikan Lakes is the primary source of water for the KPU water supply system. Water supplies are also available at Whitman Lake and the Water Lake watershed if additional quality water is needed. On Gravina Island, it is expected that a new, larger water main attached to the KPU system will provide water to the island and future development there. There are several smaller lakes on Gravina Island that might possibly serve as future water resources if needed.

KPU's main water distribution system for the City of Ketchikan consists of 3 tanks and over 21 miles of pipe ranging from 2 to 16 inches in diameter. Five hundred gallons per capita per day of water are delivered through the pipes.

Water to the airport is provided by KPU through an underground and submarine main. The airport operates its own sewer system. Residents of Pennock and Gravina Islands are responsible

for their own water and sewer systems (Ketchikan Alaska Tongass Narrows Crossing Preliminary Draft EIS vol. 1 1994).

The 1985 Comprehensive Water Plan and the Ketchikan Gateway Borough 1996 Draft Comprehensive Plan contain additional information on water supply facilities in the Borough. The Borough is in the process (2000) of updating its water supply and wastewater treatment facilities master plan, which will include a complete inventory of these facilities.

### Sewer Facilities Inventory

Both the City of Ketchikan and the City of Saxman operate sewer systems, including collector lines and treatment plants. There are an additional 21 smaller systems in operation in the Ketchikan area including larger facilities in the Mountain Point and Forest Park neighborhoods. Ketchikan's sewage treatment plant has a capacity of 8.65 million gallons per day and can handle current demand during peak flows. Saxman has a treatment plant with a capacity of 115,000 gallons per day. Approximately 2,000 dwelling units outside the city rely solely on individual on-site septic systems. The Borough is in the process (2000) of updating its water supply and wastewater treatment facilities master plan, which will include a complete inventory of these facilities.

### Contaminated Sites

The DEC (1999) has identified 15 contaminated sites in the district (*Table 11-1*). Most sites are contaminated with diesel associated with various spills and leaky above and below ground storage tanks. Four sites are under active remediation, and the remaining listed sites are of unknown status or are not undergoing active cleanup.

The former Ketchikan Pulp Company (KPC-LP) Ward Cove Mill, located 5 miles north of Ketchikan on the north shore of Ward Cove, previously exceeded EPA threshold limits for several chemicals of concern generated from former timber mill operations, including arsenic, lead, manganese, polycyclic aromatic hydrocarbons, dioxins, PCBs, and petroleum hydrocarbons. Side-scan-sonar data completed for cleanup efforts, show 500 logs per 10,000 square meters ($m^2$) in the center of Ward Cove and 100 logs per 10,000 $m^2$ near the mouth of the Cove (Exponent 1999). In 1997, KPC-LP reached an administrative order on consent with the U.S. Environmental Protection Agency and the Alaska Department of Environmental Conservation (ADEC) for clean up of the property. The consent order governed the preparation and performance of remedial investigation and feasibility studies at the site including the uplands and marine unit. With this work completed, the EPA approved records of decisions (RODs) for the marine and upland units in the spring of 2000 that govern site clean up, site redevelopment, and monitoring. Clean up and remediation of the marine unit and upland units has been completed consistent with requirements for protection of human health and the environment.

**Table 11-1.Known Contaminated Sites within the Ketchikan Gateway Borough**

| Site Name | General Location | Problem | Status of Cleanup |
|---|---|---|---|
| KPC Ward Cove Pulp Mill | Mile 7.5 N. Tongass Hwy. | Exceeds state standards for sediment, dissolved oxygen, and toxicity | EPA remediation completed. On-going monitoring required. State water body recovery plan needed. |
| Ketchikan Coast Guard Firing Range | 1300 Stedman St. | Active firing range from 1960-1995. TCLP and lead in soil. | Site intake |
| Yellow Taxi-Sourdough Cab | 531 Deermont St. | Not available | Unknown |
| North Residence | 599 Salmonberry Circle | Diesel contamination in soil | Active |
| Ketchikan General Hospital | 3100 Tongass Ave. | Underground storage tanks that have spilled. | Inactive |
| Ketchikan Federal Scout Armory | 645 Jackson St. | Petroleum contamination in soil | Inactive |
| Bailey Power Plant | Tongass Avenue near airport ferry dock | Diesel contamination in soil | Unknown |
| Marguerite Bay Logging Area | Mile 9 Tongass Hwy. | Diesel contamination in soil | Active |
| Coast Guard Base Property | Mile 1 S. Tongass Hwy. | Soil petroleum contamination | Active |
| Beaver Falls Mine | Beaver Falls, George Inlet | Small quantities of chemicals and processed metal ores. | Inactive |
| Ketchikan Tank Farm | Mile 4 Stedman St. | Soil petroleum contamination | Inactive |
| Point Higgins Radio Relay Station | Point Higgins | Petroleum, gasoline, and diesel soil contamination | Inactive |
| Herring Bay Lumber Co. | 8219 S. Tongass Hwy. | Soil diesel contamination | Inactive |
| Shoal Cove Log Transfer Facility | Shoal Cove | Contaminated soil and fresh and marine waters | Inactive |
| Biocell | Point Higgins | Biocell contaminated soil disposal site | N/A |

* See explanation in this document.
Source: Alaska Department of Environmental Conservation. 2000. Contaminated Sites Database.

## Resource Analysis

*Present and Anticipated Needs.* Overall, air quality in Ketchikan exceeds federal standards with the possible exception of some seasonal and localized problems related to wood stoves. Idling engines from trucks and cruise ships can also impact air quality in the downtown area, especially during the summer months. These impacts, however, have not been formally monitored, and are seasonal in nature and temporary. The present and anticipated needs for air resources will be from new industrial and commercial development as well as from individual users such as residents and visitors. Existing air permits are for uses such as industrial boilers, diesel power generation, and asphalt and concrete manufacture.

Residential and industrial effluent discharge to Tongass Narrows and adjacent waterbodies is a present and anticipated need in the Borough. Residential discharges include sewer outfalls. Industrial discharges include, among others, seafood waste from seafood processors and other industrial users. The demand for seafood discharges is expected to increase as a result of industry growth from secondary and value-added processing. Storm water runoff into the surrounding waterbodies will also increase with new roads and development.

Ketchikan is typical of most Southeast Alaska communities when it comes to building conditions and constraints: shallow soils with bedrock close to the surface; heavy rainfall with a high water table; steep slopes that rise directly from salt water and limited suitable land; and a relatively small population. The practical ramifications of these conditions and constraints are high site development costs; linear low-density, shore line communities; high cost and limited feasibility of providing piped water and wastewater; and greater challenges in developing safe and reliable on-site water and wastewater treatment. Land use planning and regulations must strike a balance between the fiscal burden of development costs and constraints and provision of reasonable development requirements necessary to protect public health and safety.

The State's Department of Environmental Conservation has identified fifteen upland, marine, and waterfront sites contaminated by previous industrial activity in the Ketchikan area. Four of the sites are under active remediation and the remaining listed sites are of unknown status or are not undergoing active cleanup. Ward Cove, the most prominent site, is on the State's impaired waterbody list for sediment toxicity, dissolved oxygen, and residue. The State DEC is presently preparing a Ward Cove waterbody recovery plan to establish thresholds for future industrial activity at the site. Ward Cove is the community's pre-eminent industrial site with compatible existing infrastructure, road and marine access, and utilities. It is the community's need and priority that redevelopment of this site will occur and its redevelopment will take priority over other coastal resource users.

Adequate disposal of upland residential and commercial wastewater will continue to be a pressing need in the community. Of the 6,218 dwelling units Borough-wide, it is estimated that approximately 2,000 units use some form of on-site treatment such as septic tanks and leach fields. It is estimated that only about 10% of these on-site units function properly and receive proper maintenance. To address this issue in the long-term, it is anticipated that the Borough will pursue installation of regional and neighborhood marine outfalls to reduce dependence upon on-site treatment. Development and permitting of these facilities within the coastal zone will be considered a priority community need for public health and safety. In the short-term the Borough will pursue programs that ensure the adequate maintenance of on-site wastewater treatment systems.

The majority of dwelling units outside of the City, with the exception of the Mountain Point neighborhood, depend either upon roof collection of rainwater or surface reservoir systems for supply of domestic water. Although rainwater is not an ideal method of obtaining drinking water due to the potential for contamination, it does provide a cost effective source of reasonably safe drinking water in residential quantities. Surface water systems can also provide a practical drinking water source although they can be hazardous if an adjacent failing wastewater system leeches pathogens or chemicals into the water source. In addition, while these sources provide marginal supplies of potable water, they do not provide adequate quantities of water for emergency purposes such as fire suppression. Projects that increase the supply and quality of domestic, commercial and emergency water within the coastal area will be considered a community priority for health and safety.

Ketchikan Public Utilities (KPU) provides potable water and sewer treatment to developed areas within the City of Ketchikan. Independent water sources, such as roof catchment, provide drinking water for other areas in the Borough. The KPU system has the capacity to meet the needs for regional water supply demand, but does not have a distribution network established to handle the volume and pressure loads a regional system would require. Outside of the City, with the exception of Mountain Point, sewerage disposal consists of individual on-site septic systems and marine outfalls, many of which have not been adequately maintained. Ketchikan Lakes is the primary source of water for the KPU system.

The specific present and anticipated facility and service needs include:

- Extend water distribution outside current KPU system
  - North to Peninsula Point
  - South to Mountain Point and improve water distribution system
  - Increase capacity of water line to airport
  - Extend water line from airport to Lewis Reef
- Develop the Connell Lake dam and pipeline into an industrial water and power source
- Develop regional sewer treatment facilities to provide effective long-term treatment to individual neighborhoods and community service areas
- Identify an appropriate site for establishment of a regional landfill

*Direct and Indirect Impacts*. Poor air quality can lead to health impacts on humans and wildlife. Visible emissions can diminish scenic views and have an indirect impact on tourism. Odors from seafood processing plants and other industrial processes can also detract from the air quality of the area and adversely impact any adjacent, incompatible uses such as residential development or floatplane operations. Contaminated water bodies can impede redevelopment efforts and also have a direct impact on the fish that inhabit them and the deer, bear, and other wildlife that feed and drink from them as well as impact subsistence, commercial, and sport uses of the fish. Water quality is also important to the subsistence harvest and commercial development of shellfish.

Water and sewer lines provide necessary facilities for community growth and development. In addition, they have the potential to substantially improve marine water quality through the replacement of marine outfalls and failing septic systems. Water and sewer lines do, however, have direct impacts to the locations where the lines are laid. Typically, adverse impacts are temporary and last only during construction, provided that revegetation is promoted. In locations with poor soil conditions (poor percolation, shallow bedrock, or high water tables), septic systems can fail and cause sewage contamination to surface or groundwater. This pollution can impact human health and result in odors. Sewage treatment facilities, if not properly designed and operated, can also cause pollution to receiving waters and cause odors.

Although coastal land for new wastewater outfalls is a priority coastal resource use, other coastal resources can be negatively impacted by inadequately designed and maintained systems. Contaminants such as germs, diseases, chemicals, and general debris in various systems can enter and impact other resources. In some areas, adequate currents are present to promote the mixing and dispersion of these discharges away from the shore. In other areas, adequate dispersion is not occurring. In the absence of adequate dispersion away from the shoreline, contaminants may pool in an area. Pooling results in elevated levels of the contaminants present. These elevated levels can directly impact other coastal resource users such as commercial and sports fisherman, recreational swimmers, and shoreline flora and fauna. Maintaining good water quality of coastal resources is an important aspect of Ketchikan's economic future.

*Suitability and Sensitivity*. Water and air quality are potentially sensitive to emissions from industrial processes, storm drain runoff, fish processing facilities, cruise ships and other watercraft, wastewater systems, and contaminated sites. While the current air and water quality in most of the Borough is seen as excellent, additional baseline monitoring is needed to better measure the actual impacts of various activities and to distinguish these impacts from naturally occurring compounds such as arsenic. Proper monitoring of permitted facilities, cleanup of contaminated areas, and implementation of pollution prevention measures would help minimize the potential impacts on local air and water resources, and reduce state and federal restrictions on future developments. Residential neighborhoods, business districts, or other locations where people congregate are sensitive to the location of sewage treatment facilities.

*Conflicts Among Uses and Activities*. An increase in the number of cruise ships could temporarily and seasonally affect air and water quality without adequate safeguards and procedures. Seafood processing plants, also a major component of the local economy, can emit odors and waste that can reduce values for visitor experience as well as adjacent non-compatible uses such as residential development or adjacent floatplane operations. These plants are located fairly close to town, which could in turn conflict with the area most frequented by tourists and cruise ships. The demand for air and water resources in Tongass Narrows is expected to increase with future development in this economically important waterway. Other demands, such as those from local users and visitors', will also likely increase with growth in the visitor industry and from residential development in the area. To provide adequate facilities for safe drinking water and wastewater disposal, lands will need to be set aside for exclusive watersheds limiting community expansion in areas already constrained by limited land. In addition, the need for installation of new neighborhood marine outfalls is expected to have some unavoidable impacts on the marine environment based upon public health and safety needs.

# Cultural, Historic, Prehistoric and Archaeological Resources

## Resource Inventory

### Overview

This section summarizes the results of the inventory of cultural, historic, prehistoric, and archaeological resources in the Ketchikan Gateway Borough. A detailed description of these resources is available in the Phase I Historic and Archaeological Sites Technical Memorandum (April, 2000) and Draft Reconnaissance Archaeological Survey of the Gravina Access Project (June, 2000) prepared for the Gravina Access Project (Cultural Resources Consultants), Ketchikan, A City Historic Properties Survey (1984), and Ketchikan, A Heritage Plan for Downtown and Newtown (2001).

The areas adjacent to the cities of Ketchikan and Saxman at one time were seasonal villages. Loring, Indian Point, the Clover Pass area, White River, Mahoney Creek, and Upper George Inlet have been identified as forts, villages, or seasonal settlements. [JH1]Along George and Carroll Inlets, the White River area, and Gravina Island, smoke houses and seasonal camps are known to have existed. Sealaska Corporation owns a large village site at Indian Point near Loring where gravesites date from 1922. On Gravina Island at Bostwick Inlet, the Tongass Tribe had a large summer village that was used for drying meat and gathering berries. Smokehouses are located at the head of Vallenar Bay but were abandoned when the area was homesteaded. Various locations throughout the Ketchikan vicinity contain petroglyphs (Ketchikan District CMP 1999).

The Tlingit Indians are the most widespread Indian tribe in Southeast Alaska and the most numerous in the Ketchikan area. Within the last 100 years, the Tsimpsian settled on Annette Island. The majority of historic sites in the Ketchikan area are located within 100 feet of the coast or along coastlines and navigable rivers.

### Archaeology

To date, archaeological surveys in southeastern Alaska have recorded more than 2,100 sites. A large percentage of these are shell middens, although numerous other types of prehistoric and historic resources are known (Autrey 1992). A four-part cultural sequence for southeastern Alaska proposed by Davis (1990) includes a Paleomarine tradition (9000-4500 B.C.), a Transitional stage (4500-3000 B.C.), a Developmental Northwest Coast stage (3000 B.C. to European contact), and a Historic period.

The Paleomarine tradition is used to define the earliest cultural stage yet identified within coastal southeastern Alaska. It is characterized by a well-developed microblade industry with wedge-shaped microblade cores, few or no bifacial tools, and an economy based on coastal-marine subsistence (Davis 1990). The Paleomarine tradition is followed by a transitional stage. While this stage has not been well defined, its existence is inferred because of the appearance of a ground stone tool industry that becomes dominant over the microblade and unifacial stone tool industry by 5,000 years ago. The Developmental Northwest Coast stage is differentiated from the Paleomarine and transitional stages by the presence of shell midden deposits, ground stone and bone technology, human burials, and the establishment of large settlements or winter villages, specialized camps, and fortifications.

Previous archaeological fieldwork in the Ketchikan area has been limited to small-scale surveys, such as Charles Mobley's (1995) work on U.S. Coast Guard facilities at Base Ketchikan and

Point Higgins. Also, archaeologists from the State Office of History and Archaeology have tested a prehistoric site at Refuge Cove (Reger 1999).

## Ethnography

The early historic Native peoples of Southeast Alaska represent three broad groups: the Tlingit, the Alaskan Haida (Kaigani), and the Tsimshian. Of these, the Tlingit were and are the most widespread and numerous within the region. Ethnographic Tlingit culture embodies most of what is usually thought of as northern Northwest Coast culture. This culture included an economy based upon fish (particularly anadromous fish); settled villages; a sophisticated wood working industry; a highly developed and distinctive art form; a social organization structured around lineages, clans, and phratries; and a ritual life focused upon totemism, shamanism, and the attainment of status through potlatching.

At least one principal village was established in each Tlingit tribal area. It was occupied in winter, but was usually deserted in summer when families dispersed to fishing and hunting camps. Village sites were preferably located on sheltered bays with views of the approaches. A sandy beach was important for landing canoes and for access to salmon streams, fresh water, timber, and good hunting, fishing, and gathering grounds. Aboriginal houses were planked rectangular structures, with excavated centers and low-pitched gabled roofs. They could accommodate six or more families and slaves, often totaling 40 to 50 persons. Single houses or whole villages were occasionally surrounded by palisades (de Laguna 1990).

The Tlingit were distributed in a number of localized, clan-based, territorial groups across Southeast Alaska, with some 10 or more such groups being known. At the time of historic contact, the Ketchikan area was situated within the territory of the Tongass (Tan-ta kwan) Tlingit, which included the southern potion of Revillagigedo Island; Annette, Gravina, and Duke Islands; and the area around the mouth of Portland Canal (de Laguna 1990).

The last village of the Tongass before they moved to Ketchikan was south of Nakat Inlet on Tongass Island (Goldschmidt and Haas 1946). There was a Tongass summer fishing camp at Ketchikan Creek by 1881 (Welsh 1999), and the 1883 Coast Pilot noted three Indian Houses in the area. However, all evidence of this Native settlement has apparently been destroyed by modern construction (Sealaska Corporation 1975).

On Gravina Island, at the head of Vallenar Bay, there were Tongass Wolf clan smokehouses. At Bostwick Inlet, there was a large summer village that was used by the Tongass for drying fish and meat and gathering berries (Goldschmidt and Haas 1946).

Saxman, a village 2.5 miles south of Ketchikan, was founded in 1894 by Cape Fox Natives (Roppel 1998). At one time, the Saxman Tlingit claimed all of Revillagigedo Island:

*Apparently at one time George and Thorne Arms and Carroll Inlet and the Tongass Narrows area were a portion of the Saxman territory… Though this area is [now] claimed by the Tongass people, and their right is recognized by the Saxman people, both groups actually use the area for hunting and fishing at the present time (Goldschmidt and Haas 1946).*

## History

Captain George Vancouver sailed along the western shore of Gravina Island in 1793, "but did not explore or name any of the small bays" (Roppel 1998).

Ketchikan began as a fishing town, although it quickly grew into a regional hub supplying surrounding communities and nearby mining and logging camps. Settlement began in the area around Ketchikan Creek where a saltery was built in 1884. A second saltery was located at Ward Cove at about the same time. The Ketchikan Cannery was established in 1889 and a year later George Clark and Mike Martin opened a trading post at the mouth of Ketchikan Creek (Welsh 1999).

Ketchikan was a supply center during the gold rush of the 1890s. The resulting influx of settlers and gold miners increased the population to 454 by 1900, the year Ketchikan was incorporated as a city. The city charter described the town as the center of the Ketchikan Mining District.

*"The distributing depot and furnishing station for the vast mining industries therein; that said town is the great high-way of commerce between the state and Alaska on the inland passage, and said point is the only available anchorage on the Tongass Narrows..."*

As the city outgrew the area surrounding Ketchikan Creek, the "Newtown" area, north of the present day tunnel, quickly developed into an important part of the city (Welsh 1999).

The Alaska Heritage Resources Survey (AHRS) lists approximately 250 archaeological and historical properties in the study area. The vast majority of these are historic buildings concentrated in Ketchikan. Other recorded sites in Ketchikan include a former city garbage dump (KET-435), two totem sites, a burial locale, and culturally modified trees on the U.S. Coast Guard base. There are five recorded properties in Saxman, including two petroglyph sites (one with canoe runs), a totem park, the Alaska Native Brotherhood Hall, and a clanhouse.

Nineteen properties in Ketchikan and Saxman are listed on the National Register of Historic Places, and another 30 have been determined eligible for the Register. Among these are the Headquarters Building of the 16th Lighthouse District (KET-279) and the Coast Guard Supply Warehouse (KET-356) in Ketchikan, and the Chief Kashakes House in Saxman. The latter, built in 1889, is associated with two totem poles and three burials.

On Pennock Island, opposite Saxman, there is a late nineteenth and early twentieth century cemetery (49-KET-055) (Sealaska Corporation 1975). This was originally a burial ground of the Saxman Tlingits with grave houses and commemorative totems, although it was also used by the people of Ketchikan (Roppel 1998).

On Revillagigedo Island, northwest of Ketchikan, there is the Ward Cove Packing Company (KET-292) and the Refuge Cove site (KET-303). The Ward Cove Packing Company, originally the Walsh Moore Canning Company, was built in 1912 (Roppel 1998). The Refuge Cove Site is a small shell midden that was occupied about 800 to 1500 years ago.

The Port Gravina site (KET-027), on Gravina Island at the northern end of the Ketchikan airport runway, was established in 1893 by a group of Tsimpsians from Metlakatla who had attended the Sitka Industrial Training School (Roppel 1998). Originally consisting of a sawmill, residences, a store, a government school, and a church, Port Gravina was the first business to be built,

managed, and operated entirely by Alaska Natives. The village was sited along the waterfront "with one street leading to the store, dock, and sawmill at the north end" (Roppel 1998). The settlement was abandoned after the sawmill and more than half of the other buildings were destroyed by fire in 1904 (Roppel 1998).

Although ethnographic accounts mention a number of localities used by the Tlingit in the Ketchikan area, only three prehistoric archaeological sites have been officially recorded on the AHRS. However, as mentioned previously, much of the project area has not been intensively inventoried, and the possibility of locating additional sites should not be ruled out. The few known prehistoric sites in the project area, such as the Refuge Cove site and petroglyph sites in Saxman, are all along the coast.

In addition to the properties listed in the AHRS, there are numerous historic sites along the shores of Tongass Narrows mentioned in *Land of Mists*, Patricia Roppel's (1998) geographical and historical guide to Revillagigedo and Gravina Islands. Roppel only occasionally mentions the condition of any remains at these sites, although her narrative does give a sense of the intensity of historic settlement in the region.

Ward Cove was used by the U.S. Coast and Geodetic Survey as an anchorage during survey trips in the area in the late 1880s (Roppel 1998). By 1898, there was a small village on the western side of the cove including a wharf, a store, a post office, and "a few dwellings." Several salteries were built in the cove during the late 1890s and early 1900s. At the head of the bay, "on the west point of the entrance to what is now called Ward Creek," was the Revillagigedo sawmill (Roppel 1998). Opposite the sawmill, Eugene Wacker, who homesteaded in Ward Cove in 1910, platted a town site. Wacker, as the settlement was called, had a school and post office, although several attempts to incorporate it as a second class city failed. Ketchikan Pulp Company purchased the town and built much of its plant on the site (Roppel 1998).

On Charcoal Point, which was ultimately incorporated into Ketchikan's waterfront, there was an arrastre to grind ore from nearby gold claims. In 1904, Davis and Son had a boatyard at the point. A Marconi wireless station, a shipyard, and a cannery were built there in the 1910s and early 1920s.

North Saxman, also called Port Dundas, was a small settlement on a point about three-eighths of a mile northwest of Saxman. The Verney Brothers Lumber Company built a steam sawmill there in 1900 and owned practically all of the town's buildings (Roppel 1998).

The earliest farm on Gravina Island was apparently settled by F.H. Fedler in 1907 (Roppel 1998), although the largest settlement on the western channel of Tongass Narrows was at Clam Cove. Antone Stensland homesteaded there in 1913, and in 1914 the USFS built a boathouse and shipyard. This marine station, which included a one-room school and several houses, operated until about 1950 (Roppel 1998). The U.S. Coast and Geodetic Survey constructed a boathouse and wharf in East Clump bight in 1921 (Roppel 1998). The Goldstream Mine, claimed around 1900, was on the southern end of Gravina Island (Roppel 1998). There were two other groups of claims about one-quarter mile south of the Goldstream mine, where exploratory work took place prior to 1908. Here, there are reportedly the remains of an ore mill (Roppel 1998).

Dan Whipple homesteaded on Gravina Island in 1910, but in 1919 he moved to a home site on the northern end of Pennock Island (Roppel 1998). Fred Borg built a house and a small boathouse on the northern end of Pennock Island in 1903. Heckman and Company had a storehouse on the island in 1908 (Roppel 1998). In Whisky Cove, opposite the U.S. Coast Guard

base, there were two boathouses and a machine shop dating from the late 1910s or early 1920s. Erik Forss also had a ranch at the cove (Roppel 1998). In Radenbough Cove, there was a shipyard built by Charles Radenbough sometime before 1911, as well as cabins, wharves, and docks (Roppel 1998). Snow Island, at the northwestern end of Pennock Island, was the home of Major Ray Snow, who settled there in 1926 (Roppel 1998).

The Mineral Management Service (MMS) documented numerous shipwrecks in Tongass Narrows (*Table 12-1*). Other than information listed here, MMS knows little regarding current locations and condition of shipwrecked vessels.

**Table 12-1.Summary of Historical Shipwrecks in Tongass Narrows**

| Vessel Name | Vessel Type | General Wreck Location | Wreck Date | General Details |
|---|---|---|---|---|
| Unuk | gas screw | 1 mi N of Channel Island Light, near Ketchikan | July 28, 1929 | Unuk sank after colliding with the gas screw Confidence. The Confidence immediately put lines on the Unuk and towed it into Wards Cove. |
| Albatross | gas screw | 4 mi NW of Ketchikan, entrance to Ward Cove | Oct. 8, 1926 | Backfiring engine caused fire and vessel burned. |
| Margaret | gas screw | General Petroleum Dock, Ketchikan | July 11, 1937 | Explosion in port gas tank caused fire. |
| Dreamer | gas screw | Gravina Island, opposite Peninsula Point on Revillagigedo Island | Aug. 2, 1925 | Fire from light plant burned vessel. |
| De Wet | gas boat | Ketchikan | Oct. 24, 1909 | Lost. |
| Delight | gas boat | Ketchikan | Feb. 1920 | Lost. |
| P.G. No. 6 | Scow | Ketchikan | Nov. 1917 | Lost. |
| Sea Bird | Tug | Ketchikan | Mar. 1909 | Wrecked. |
| **K. No. 4 | wood scow | North Clock Point, near Ketchikan | July 15,1913 | Broke loose from moorings, stranded, and wrecked in heavy SE winds. |
| Aberdeen | gas screw | North end of Gravina Island | Aug. 8, 1923 | Spark from exhaust pipe caused fire and vessel burned. |
| Sunny Point | gas screw | Peninsula Point, near Ward Cove | Jan. 13, 1928 | Engine burned from explosion and fire caused by backfiring engine. |
| Iowa | gas screw | Standard Oil Dock, Ketchikan | July 15, 1927 | Burned from fire started while refueling. |
| Taku II | gas screw | Standard Oil Dock, Ketchikan | Aug. 11, 1937 | Destroyed by fire and explosion of unknown origin. |
| Lakewood | gas screw | Thomas Basin, Ketchikan | Feb. 4, 1932 | Fire caused by explosion of gas tank. |
| Inger | gas screw | Tongass Narrows near Gravina Island, across from Smiley's Cannery | Oct. 3, 1925 | Backfire caused gas explosion and vessel burned |
| Carita | * | Tongass Narrows, off Ketchikan | March 20, 1905 | * |
| California | steamer | Ward Cove | Sept. 1910 | Wrecked |
| Princess | steamer | Ward Cove | March 24, 1905 | Wrecked |
| W.T. & B Co. No. 33 | wood scow | Ward Cove | Mar. 5, 1927 | Vessel blown ashore in high wind when winter moorings gave way. |
| Buckeye | gas screw | Whiskey Cove, Pennock Island, near Ketchikan | Jan. 26, 1926 | Explosion and fire destroyed vessel. |

## Resource Analysis

*Present and Anticipated Needs.* The Ketchikan Gateway Borough contains numerous historic and archaeological sites, including villages, fish traps, smokehouses, campsites, grave and burial

sites, totem sites, houses, buildings, warehouses, and petroglyphs. The Tlingit Indians are the most abundant Native American tribe in the Borough, and these sites reflect the wide extent of their culture. Some of the cultural resources in the Borough are publicly known and identified as cultural features for visitation by the community and tourists. Sites such as Totem Bight State Park will benefit from improved access and construction of additional parking facilities. Other sites are not publicly known and public visitation or discovery is not encouraged in order to protect the integrity of the sites and prevent vandalism. The cultural and historic resources of the area, in combination with the growing tourist industry, have important visitor value in addition to the cultural value they provide to local residents. Expanding public awareness of the range of cultural resources in the community (e.g., through interpretive signs and information centers) and preserving and enhancing of historic and cultural resources in the Borough should be considered during district planning and development.

*Direct and Indirect Impacts.* Development near or at historic and archaeological sites could have direct, indirect, and secondary impacts on the cultural environment and the integrity of the sites. Direct impacts to cultural resource sites could result from construction activities that would disturb or eliminate the sites. In addition, sites that contribute to the visitor experience and, correspondingly, to tourism revenue, could receive direct and indirect adverse impacts as a result of new buildings, roads, or other structures that are incompatible with the historic setting of the resource. Sites that are located in remote areas and are currently undisturbed could sustain secondary impacts as part of roadway improvement projects or other types of development that bring people to areas that are currently inaccessible. Visitors to these areas may unintentionally deface burial sites and campsites. Easier access to these sites also increases the possibility of vandalism.

*Suitability and Sensitivity.* Historic and archaeological sites are sensitive to physical disturbance. However, identifying sites suitable for interpretation and developing tours, such as those at Saxman and Totem Bight State Park, could aid the visitor industry. Conversely, sites that are not publicly known and are relatively undisturbed maintain a level of cultural integrity that makes them particularly sensitive to development. The controversy associated with the proposal to locate an aquarium near a cultural retreat north of Herring Bay on George Inlet is an example of how cultural sensitivity may affect resource use decisions. Development in areas with known or suspected cultural resources will be reviewed by affected agencies and tribal groups to consider protection measures.

*Conflicts Among Uses and Activities.* Cultural resources are often found in areas well suited for community expansion, since these areas are typically located along the waterfront, with flat topography, and good access. Because of these features however, these areas are often also suitable for developing new homes, industrial and commercial buildings, and roads that could disturb or possibly destroy cultural resource sites. Appropriate steps taken during project planning and development, however, can help to avoid or minimize adverse impacts to these resources.

# Implementation

## SECTION CONTENTS



**11 AAC 114.280. Implementation.** A district plan must describe
(1) the methods and authorities used to implement, monitor, and enforce the district plan; methods and authorities
(A) must be adequate to ensure plan implementation and enforcement;
(B) must describe implementation responsibilities of cities within coastal resource service areas and boroughs; and
(C) may include, if appropriate,
(i) land and water use plans;
(ii) municipal ordinances and resolutions, including shoreline and
zoning ordinances, and building codes;
(iii) state and federal statutes and regulations;
(iv) capital improvement programs;
(v) the purchase, sale, lease, or exchange of coastal zone land and
water resources;
(vi) cooperative agreements such as memoranda of understanding;
(vii) tax exemptions for non-development purchase of development rights;
(viii) coordinated project or permit review procedures; and
(ix) the means and procedures to document public need for
purposes of submitting comments under 11 AAC 110; and

## I. INTRODUCTION

This chapter of the Ketchikan Gateway Borough district plan accomplishes the following:

- Describes the Ketchikan organization
- Provides Ketchikan with instructions on how to use its coastal management program and participate effectively in state consistency reviews
- Explains to other ACMP network participants how best to work with Ketchikan in implementing its coastal management plan
- Provides the people of Ketchikan, landowners, and development project applicants with an understanding of how the Ketchikan CMP will be used

Organization
Ketchikan is a second class borough and is eligible to be a coastal district in accordance with state law at AS 46.40.210(2)(B). The City of Ketchikan is a home-rule city and the City of Saxman is a second-class city both of which are located within the Borough. Ketchikan Gateway Borough exercises area-wide planning and zoning authority within these cities and throughout the Borough.

Local ACMP decisions and actions are ultimately the responsibility of the Borough Assembly. The Assembly has delegated ACMP implementation duties to the Borough Manager who has delegated program administration to the Borough Planning Director. The Planning Director has delegated certain duties to the CMP Coordinator, a position within the Borough Planning Office. The CMP Coordinator is authorized to make routine decisions and to participate in consistency review and other daily implementation tasks.

The Planning Director works with the Borough Planning Commission, which serves as a judicial body for the Borough Assembly, to implement the Borough Coastal Management Plan (CMP). The Planning Director regularly consults with the Planning Commission on matters related to implementation of the Coastal Plan. Decisions about large or controversial projects, or projects recommended for denial by staff, will be brought to the Planning Commission, and the Assembly on appeal, for final action. Any staff conditions of approval may also be appealed directly to the Planning Commission by the applicant.

The point of contact for local consistency reviews involving Ketchikan coastal zone lands is the Ketchikan CMP Coordinator. The address of the CMP Coordinator is:

Ketchikan Planning Department
Attn: Coastal District Coordinator
344 Front Street
Ketchikan, Alaska 99901
(907) 228-6610

Subject Uses

In accordance with 11 AAC 100.010, land and water uses and activities in the coastal zone that are subject to a consistency review and district enforceable policies include the following:

- Federal activities affecting coastal uses or resources
- Land and water uses and activities requiring federal permits or authorizations (see 11 AAC 110.400)
- Land and water uses and activities requiring state permits or authorizations
- Local planning permits
-

Proper and Improper Uses he Alaska Administrative Code under 11 AAC 114.260 requires that district plans identify uses and activities, including uses of state concern, that are considered proper and improper within the coastal area. Ketchikan has not identified any uses which are categorically prohibited within the coastal boundary. Proper and improper uses are determined by their compliance with federal, state, and local permitting requirements.

All land or water uses or activities within Ketchikan are considered to be proper as long as they comply with the policies of this coastal management plan, the ACMP standards under 11 AAC 112, all applicable federal and

**11 AAC 114.250. Subject uses, activities, and designations.** (a) A district plan must include a description of the land and water uses and activities that are subject to the district plan. The uses and activities subject to a district plan are limited to those included in 11 AAC 112.200 – 11 AAC 112.240, 11 AAC 112.260 – 11 AAC 112.280, and (b) - (i) of this section.

(b) A district shall consider the likelihood of occurrence of natural hazards in the coastal area and may designate natural hazard areas.

(c) A district shall consider and may designate areas of recreational use. Criteria for designation of areas of recreational use are

(1) the area receives significant use by persons engaging in recreational pursuits; or

(2) the area has potential for recreational use because of physical, biological, or cultural features.

(d) A district shall consider and may designate areas of tourism use. Criteria for designation of areas of tourism use are the area receives or has the potential to receive significant use by the visitor industry using cruise ships, floatplanes, helicopters, buses, or other means of conveying groups of persons to and within the area.

(e) A district shall consider and may designate, in cooperation with the state, sites suitable for the development of major energy facilities.

(f) A district shall consider and may designate areas of the coast suitable for the location or development of facilities related to commercial fishing and seafood processing.

(g) Except in nonsubsistence areas as identified under AS 16.05.258, a district may, after consultation with appropriate state agencies, federally recognized Indian tribes, Native corporations, and other appropriate persons or groups, designate areas in which a subsistence use is an important use of coastal resources and designate such areas.

state regulations. All other land or water uses or activities are considered to be improper if they are inconsistent with ACMP standards or the policies of this plan or if they do not comply with or cannot be made to comply with applicable federal, state, or local regulations. Designated areas included in this plan identify specific land or water uses and activities that will be allowed or not allowed.

(h) A district shall consider and may designate portions of habitat areas listed in 11 AAC 112.300(a)(1) – (8) and other habitats in the coastal area as important habitat if
(1) the use of those designated portions have a direct and significant impact on coastal water; and
(2) the designated portions are shown by written scientific evidence to be significantly more productive than adjacent habitat.
(i) A district shall consider and may designate areas of the coast that are important to the study, understanding, or illustration of national, state, or local history or prehistory.
(j) Areas proposed for designation by a district under (b) – (i) of this section are subject to public review and comment under 11 AAC 114.300 – 11 AAC 114.330 or 11 AAC 114.345(a) - (j) before approval by the commissioner. (Eff. 7/1/2004, Register 170)

Designated Areas

District policies related to natural hazards; energy facilities; subsistence; historic, prehistoric and archeological resources; recreation; tourism; commercial fishing and seafood processing; and habitat only apply to projects within designated use areas identified in this plan.

Uses of State Concern

Uses of state concern are uses and activities that are considered to be of state or national interest. Ketchikan cannot restrict or exclude uses of state concern unless the district provides ample justification for the exclusion or restriction with the district plan.

**11 AAC 114.260. Proper and improper uses and activities.** A district plan must describe the uses and activities, including uses of state concern, that will be considered proper, and the uses and activities, including uses of state concern, that will be considered improper,
within the district's coastal zone, including land and water use designations. This description must be based on the district's statement of issues, goals, and objectives under 11 AAC 114.200 and must be consistent with the statewide standards set out in 11 AAC 112. (Eff. 7/1/2004, Register 170)

Alaska Statutes at AS 46.40.210(12) defines uses of state concern. In addition, the former Coastal Policy Council issued Resolution Number 13 that specifies more categories and criteria for uses of state concern. This resolution remains in effect until it is superseded by statues or regulations or until it is formally rescinded by DNR.

## II. CMP PARTICIPANTS' DUTIES AND RESPONSIBILITIES

Ketchikan Planning Commission

The Borough Assembly has delegated local implementation of the Ketchikan CMP to the Borough Manager and the Planning Director. The Planning Commission sometimes implements the Borough CMP when issuing consistency comments. The Planning Commission normally delegates authority to make consistency comments to the Borough CMP Coordinator, who acts under the authority of the Planning Director. In addition, the Planning Commission has the following responsibilities:

- Monitor and assess consistency comments issued on its behalf by the CMP Coordinator.
- Review every five years and amend, if required, the Ketchikan CMP.
- Review every year whether the Ketchikan Gateway Borough is appropriately implementing the Ketchikan CMP.

- Submit every ten years the Ketchikan CMP to OPMP for reapproval. The submittal shall include an evaluation of the plan effectiveness and implementation, a presentation of any new issues, and a recommendation for resolving any problems that have arisen.
- Conduct consistency reviews in cases where staff recommends a finding of inconsistency.

Ketchikan CMP Coordinator

The Ketchikan CMP Coordinator is a member of the Ketchikan Planning Department staff and serves as dedicated staff to the Ketchikan Planning Commission. The CMP Coordinator is supervised by and is under the authority of the Ketchikan Planning Director. The CMP Coordinator may also receive oversight and direction from the Planning Commission.

The CMP Coordinator has day to day responsibilities within the Ketchikan Planning Department for the administration of the Ketchikan CMP. He or she must:

- Help applicants fill out the coastal project questionnaire (CPQ) including an evaluation of the district's enforceable policies along with the boundary determination and educate them about the ACMP and the Ketchikan CMP throughout the process.
- Ensure that information has been received in a timely manner by the parties involved in the consistency review process
- Determine if information received is complete and sufficient for a consistency review
- Decide which projects are routine and which projects have great significance to the coastal zone and should be reviewed and discussed with the Planning Commission (routine approvals will be processed by the CMP Coordinator)
- Evaluate uses and activities that require local, state, or federal permits or authorizations for consistency
- Evaluate proposed projects against the enforceable policies of the Coastal Program
- Accurately assess the effect of applicable policies of the Ketchikan CMP on the application
- Manage project information to ensure that it reaches all affected persons and organizations
- Draft effective, concise and comprehensive consistency determinations and recommendations and produce evidence in support of the conclusions reached
- Develop draft consistency comments and alternative measures for consideration by the Planning Commission, when necessary
- Integrate feedback from the local contacts and other interested parties into the Ketchikan's consistency recommendation
- Coordinate consistency review activities with adjoining coastal districts where issues or activities of mutual concern are under consideration
- Prepare and submit the consistency recommendation in a timely manner
- Prepare quarterly and annual reports to the state, as required by the Ketchikan's ACMP grant agreement
- Facilitates and receives public input, and acts as an information resource concerning the Ketchikan CMP

The CMP Coordinator represents the Ketchikan at meetings, conferences, and in ongoing interactions with applicants, the general public and state and federal agency staff regarding the Ketchikan CMP.

## III. GENERAL CONSISTENCY REVIEW INFORMATION

Because the State of Alaska has adopted the Ketchikan CMP as an amendment to the ACMP, Ketchikan is one of several reviewers that concurs or objects to an applicant's consistency certification or a federal agency's consistency determination to the coordinating agency during consistency review. Based on these comments and on the policies and procedures of the ACMP, the coordinating agency issues a consistency finding.

Two Types of Consistency Reviews

The enforceable components in this plan form the basis for a determination of consistency with the Ketchikan CMP. There are two types of reviews: state-coordinated consistency reviews and locally-coordinated consistency reviews. When a project is proposed, State ACMP project reviewers determine which authorizations are needed. If the project is a federal activity, or needs state or federal authorization, the State of Alaska reviews the project for consistency with the ACMP. Ketchikan participates in the state-coordinated review (**see Section 4**). If only local authorization is required (but not state or federal authorization), then the Ketchikan itself reviews the project for consistency with the ACMP (**see section titled BOROUGH COORDINATION OF LOCAL CONSISTENCY REVIEW**).

Determination of Consistency in Connection with Other Permits and Approvals

In addition to consistency, an applicant is required to obtain all other necessary permits and approvals required in connection with a proposed project. A determination of consistency does not guarantee or presume approval of any other federal, state, or local permit.

DEC "Carveout"

DEC's air, land, and water quality standards are the exclusive standards of the ACMP for those purposes. Issuance of DEC permits, certification, approvals, and authorizations establishes consistency with the ACMP program for those activities of a proposed project subject to those permits, certifications, approvals, or authorizations. A project that includes an activity subject to a DEC authorization on the C list (see ABC List next) may be subject to a coordinated review if the project includes a different activity that is not subject to a DEC authorization but is the subject of an enforceable district policy or another C-listed authorization. However, the specific activities subject to the DEC authorization are not within the scope of those project activities to be reviewed.

In the case of a DEC single agency review, the scope of review is limited to an activity that is the subject of a district enforceable policy. DEC Policy Guidance No. 2003-001, January 7, 2004, contains the actual procedure by which DEC will participate and coordinate in ACMP consistency reviews. This document is titled "DEC Single Agency Coastal Management Consistency Review Procedures and sets forth the "Uniform Procedures for Conducting a Coastal Management Consistency Review for Projects that Only Require a [DEC] Permit or Contingency Plan Approval to Operate."

ABC List

The ABC List is a classification system of state and federal approvals that can streamline the consistency review portion of the state permitting process for a proposed project. The intent of the ABC List (specifically the "A" and "B" portions of the List) is to reduce the amount of time reviewers must spend on reviewing routine individual projects, allowing them to concentrate on more complex projects that require more involved ACMP consistency review.

The ABC List actually breaks down into three lists:

- The "A" List represents categorically consistent determinations – approvals of activities requiring a resource agency authorization, when such activities have been determined to have minimal impact on coastal uses or resources.
- The "B" List has been broken into two sections. Section I of the "B" List represents generally consistent determinations – approvals for routine activities that require resource agency authorization(s), when such activities can be made consistent with the ACMP through the application of standard measures. Section II of the "B" List includes nationwide permits and general permits that have been found to be consistent with the ACMP.
- The "C" List represents a comprehensive listing of those state permits that may trigger consistency review.

Projects do not always fit neatly into just one of the three lists (the "A," "B," or "C" List). Some projects need authorizations that fall under more than one list or include activities that are not found in the "B" List. For these projects, OPMP will determine how much review the project requires.

Federal Authority and Consistency Determination

In accordance with federal law, the Ketchikan coastal zone excludes all federal lands and waters within its boundaries. Federal lands and waters are those lands and waters managed, owned, or held in trust by the federal government.

However, the federal government is not exempt from the ACMP or the Ketchikan CMP. Federal law requires "federal agencies, whenever legally permissible, to consider State management programs as supplemental requirements to be adhered to in addition to existing agency mandates." (15 CFR 930.32(a)). The federal government meets this requirement in several ways, depending upon the type of project or activity being considered.

First, federally licensed or permitted activities proposed within the coastal area and affecting coastal uses or resources must be **consistent** with the ACMP, including the Ketchikan CMP. (15 CFR 930.50).

Second, federal license and permit activities described in detail in Outer Continental Shelf plans and affecting coastal uses or resources must be **consistent** with the ACMP including the Ketchikan CMP (15 CFR 930.70).

And finally, all **federally conducted or supported activities**, including **development projects** directly affecting the coastal zone, must be **consistent to the maximum extent practicable** with the ACMP, including the Ketchikan CMP. Federal activities are "any functions performed by or on behalf of a federal agency in the exercise of its statutory responsibilities." This term does not include the issuance of a federal license or permit. Federal development projects are those federal activities "involving the construction, modification, or removal of public works, facilities, or other structures, and the acquisition, utilization, or disposal of land or water resources." (15 CFR 931.31) The phrase "consistent to the maximum extent practicable" means that such activities and projects must be "fully consistent with such programs unless compliance is prohibited based upon the requirements of existing law applicable to the federal agency's operations." (15 CFR 930.32(a)).

# IV. BOROUGH PARTICIPATION IN STATE-COORDINATED CONSISTENCY REVIEW

Procedure

The point of contact for state and federal consistency reviews involving the Ketchikan CMP is the Office of Project Management and Permitting (OPMP). OPMP addresses are:

Southcentral Regional Office
550 W 7th Ave, Ste. 1660
Anchorage, AK 99501
(907) 269-7470/Fax#: (907)-269-3981

Central Office
302 Gold Street, Ste. 202
Juneau, AK 99801-0030
(907)-465-3562/ Fax#: (907)-465-3075

The state-coordinated consistency review process is contained in state regulations at 11 AAC 110. The Ketchikan may participate in that process as an affected coastal district. A brief discussion of the Ketchikan's role in the state consistency review process is described in this section. However, applicants should obtain current information on the state consistency review process from OPMP.

The Ketchikan strongly recommends that applicants who seek state or federal permits for a major or complex project in the coastal zone request pre-review assistance prior to submitting such an application. The Ketchikan seeks to work with applicants to initiate early communication and facilitate an expedient and informed consistency review.

The coordinating agency will notify the borough of a pending consistency review. If requested, the borough will participate in determining scope of review of a proposed project, based on the borough's enforceable policies.

Upon the notification from the coordinating agency of the start of a consistency review, the Ketchikan CMP Coordinator will determine whether the project information is adequate to allow the Borough to concur or object to an applicant's consistency certification. If more information is required, the Borough will notify the coordinating agency by the "request for additional information" deadline and specifically identify the additional information required.

Permit Application Meeting

During a consistency review, the CMP Coordinator may contact the coordinating agency to request a meeting to resolve issues. The purpose of the meeting is to discuss coastal management and permitting issues of the proposed activity and to work toward resolution of issues of concern and potential conflicts. This meeting should be scheduled no later than 10 days after notification of the action is received by the CMP Coordinator. At a minimum, representatives of the coordinating agency, the Ketchikan coastal district, affected major landowners, the applicant, affected interest groups and organizations, and affected resource agencies will be invited to participate. Depending on the nature of the activity and travel constraints, the meeting may involve a meeting or teleconference. Subsequent work sessions may be beneficial to reaching early consensus on the consistency determination. Scheduling a permit application meeting does not change the final consistency review deadline of ninety days as directed in 11 AAC 100.265.

Consistency Comments

During the period allowed to review and consider the proposed use, Ketchikan will prepare written comments on the applicant's consistency certification. In preparing a consistency review comment the borough will comment on consistency with state and local standards. In order to be considered by the coordinating agency, borough comments must be in writing and must

- state that the borough concurs with the applicant's consistency certification and explain why or
- identify that the borough objects to the applicant's consistency certification.

If the borough objects, the borough must

- identify and explain why the proposed project is inconsistent with specific state standards or district enforceable policies and
- identify any alternative measure that, if adopted by the applicant, would achieve consistency with the specific state standard or district enforceable policy.

Alternative measures are project conditions proposed by a state resource agency or coastal district that, if adopted by the applicant, would make the project consistent with either state standards or district enforceable policies. If the borough proposes alternative measures, they must explain how the alternative measure would achieve consistency with the specific enforceable policies in question.

When the consistency review is routine in nature and the Ketchikan Planning Commission does not need to take action, the CMP Coordinator will issue the Borough's consistency comments on behalf of the Planning Commission. Other more complex or controversial local projects, such as property rezonings, subdivisions, use permits, variances, or land disposals would require findings of coastal plan consistency by Planning Commission or by the Borough Assembly on appeal. The code of ordinances will be amended to require approval of appropriate consistency findings for individual permits.

Upon receiving notice of local, state, or federal permit application, the CMP Coordinator will notify the mayor/ city manager of any cities or villages, the president of any IRA Councils or Traditional Councils, and the appropriate regional non-profit corporation that could potentially be affected by the proposed action. The CMP Coordinator will also determine if major landowners will be affected by the proposed action and will contact their representatives to identify concerns and special conditions for development.

The CMP Coordinator will ensure that local concerns are solicited and appropriately incorporated in Ketchikan's consistency comments. Local input upon Ketchikan's consistency comments must be received promptly in order to meet the state review deadlines. The borough will consider such input in developing comments and alternative measures regarding the consistency of a proposed project. Where local concerns cannot be incorporated in the Ketchikan consistency comment, the CMP Coordinator must provide justification for this decision to the local contacts involved.

Public Hearing During a State-coordinated Consistency Review

Any person or affected party may request that the coordinating agency hold a public hearing on a project or activity undergoing a consistency determination by providing adequate justification for the request as specified in 11 AAC 110. During the initial consistency review, the CMP Coordinator, in consultation with the Planning Commission and affected parties, may decide that the scope of a project will require a public hearing. If a public hearing is needed, the CMP Coordinator will submit a written request to the coordinating agency that they hold a public hearing and outline the need for such a hearing. The coordinating agency will review the request to determine if it is based on concerns not already adequately addressed in the review. If a public hearing is held, the ninety day deadline in 11 AAC 110.265 for completing the consistency review is unchanged. The coordinating agency should be consulted for the exact schedule.

Changes in the Nature of a Permitted or Approved Activity

Per 11 AAC 110.280, an applicant that proposes a modification to an activity for which a final consistency has been issued must submit a new coastal project questionnaire to the agency that coordinated the consistency review. The modification is subject to another consistency review if the modification will have significantly different effects than the existing use on the resources of the Ketchikan coastal zone and if a new authorization or change in authorization is required.

In those cases when approval of a consistency reviewed is required by the Planning Commission at a public hearing due either to project complexity or to determine consistency with local laws, the Ketchikan CMP Coordinator will notify the coordinating agency and the applicant prior to expiration of the timeline for requesting additional information from the applicant. When it is expected that the Planning Commission process will take longer than the state timeline allows, the Ketchikan CMP Coordinator, with the applicant's consent, shall request that the coordinating agency suspend further state review pending the outcome of the local review process.

Due Deference

Due deference is a concept and practice within the consistency review process that affords the commenting review participants the opportunity to include, review, or refine the alternative measures or consistency concurrence if they have expertise in the resource or the responsibility for managing the resource. The borough and resource agencies are provided deference in interpretation of policies and standards in their area of expertise or area of responsibility. First, in order to be afforded due deference, the district must have an approved district plan and have commented during the consistency review. Then the district may be afforded due deference if no resource agency has specific authority or expertise and if the district can demonstrate expertise in the field. A district doesn't have to have a specific policy that applies to the proposed project under review. The district may comment on the consistency of the proposed project within the state standards.

If the coordinating agency rejects the comments of the Borough or any alternative measures that the Borough might seek to have imposed on the application in connection with a consistency determination, the coordinating agency must provide a brief written explanation stating the reasons for rejecting or modifying the alternative measure. *Note: this requirement only applies when the coordinating agency disagrees with the Borough on issues involving the interpretation and application of the Ketchikan CMP*.

## V. BOROUGH COORDINATION OF LOCAL CONSISTENCY REVIEW

Under the provisions of AS 46.40.100, actions and approvals by local governments are also subject to consistency with approved district coastal management programs. In some cases, a proposed action requiring a municipal permit or approval will also need a state or federal permit, and the federal/state consistency review will take place at the state level. Sometimes, a proposed action will only require a municipal permit and no state or federal permit. In such cases, the municipal government is responsible for reaching the consistency determination.

The Ketchikan coastal management program requires that all development projects that need a local permit within the Ketchikan Coastal District be evaluated for consistency with the policies in this plan. The Ketchikan Coastal District will implement and enforce this plan by performing consistency reviews of projects that require a local permit or approval but no state or federal permit. The Ketchikan Coastal District will use its existing authority under Title 29 to implement and enforce this program with regard to local activities occurring within the district. The Borough has adopted a strategic plan, subdivision ordinance, and zoning ordinance. The district

will use these and other existing ordinances as a means of, and authority for, implementing and enforcing this coastal management program. No new permits or staff is proposed beyond those currently used in the local development review process.

The policies of the Ketchikan CMP will be considered simultaneously during local review of all zoning permits, use permits, variances, subdivisions, rezonings, capital improvement programs, and Borough land disposals. Projects that do not require either state or federal permits, and are consistent with Borough zoning provisions, would be considered consistent with the coastal plan. Other more complex or controversial local projects, such as property rezonings, subdivisions, use permits, variances, or land disposals would require findings of coastal plan consistency by Planning Commission or by the Borough Assembly on appeal. The code of ordinances will be amended to require approval of appropriate consistency findings for individual permits.

Uses Subject to Local Consistency Review

All uses that are proposed in the Ketchikan coastal zone that do not require federal or state authorization or that is not a federal activity will require a determination of consistency from the Ketchikan coastal district if they are among the following local subject uses:

- All land and water uses requiring a permit or approval in accordance with the Ketchikan Gateway Borough Code of Ordinances including zoning, subdivisions, and land disposals. sections

Ketchikan procedures for local consistency determinations will be conducted concurrently with review of an other necessary permits.

Application Procedure and Time Line

There is no separate application for a local consistency determination under the Ketchikan CMP. Rather, the applicant desiring to undertake a subject use applies to the Ketchikan Planning Department for the required land use permit or approval. When an application involves land within the Ketchikan coastal zone the land use permit application usually provides Ketchikan Planning Department with the information required in order to make a CMP consistency determination.

Local Consistency Determinations

The point of contact for local consistency reviews involving Ketchikan coastal zone lands is the Ketchikan CMP Coordinator, a staff position in the Ketchikan Department of Planning. The address of the CMP Coordinator is:

Ketchikan Planning Department
ATTN: CMP Coordinator
344 Front Street
Ketchikan, Alaska 99901
(907) 228-6610

Ketchikan will issue its consistency determination in conjunction with the underlying zoning permit or approval. The underlying permit or approval process will establish the time line for a local Ketchikan CMP consistency determination. If the information provided by the applicant is incomplete or insufficient to allow a local consistency determination, the Borough will ask the applicant for the missing or required information in accordance with local authorization procedures.

The Ketchikan zoning ordinance details the review process and schedule for each specific permit or approval required. Ketchikan will conduct its consistency review concurrently with its zoning permit or approval review process.

Upon issuing its zoning permit or approval, the Ketchikan will also issue a consistency determination. Subject uses within the Ketchikan Gateway Borough that do not require a state or federal authorization or that is not a federal activity will have a local consistency determination made by the borough. The uses listed as permitted for each zoning district within the borough's zoning ordinance shall be deemed to meet the Ketchikan CMP policy requirements for subject uses that do not require a state or federal permit. Rezoning, conditional uses, and new subdivisions are actions that require local consistency determinations by the borough based on the policies of the Ketchikan CMP.

Reviewing certain actions for coastal consistency under a municipal zoning and subdivision ordinance does not make these land use controls part of the Ketchikan plan and subject to state review and approval. Therefore, amendments to the local zoning and subdivision ordinances will not require an amendment to the approved Coastal Program; however, the local zoning and subdivision ordinances may not conflict with the district Coastal Program.

Ketchikan strongly recommends that applicants who seek authorization from the Borough for a major project requiring local consistency review request a pre-application meeting before submitting the application.

## VI. ELEVATION PROCESS/ APPEALS

Elevation of State Consistency Determination
Elevations of a consistency determination issued by a coordinating agency follow the procedures established under regulations at 11 AAC 110.600.

Appeal of Local Consistency Determination
The applicant, or any aggrieved person, may appeal the Ketchikan's consistency determination to the Ketchikan Planning Commission or Assembly, in accordance with the procedures established for the appeal of the underlying zoning permit or approval in the Ketchikan zoning ordinance. Subsequent appeals may be made to the Superior Court in accordance with the procedures established in the Ketchikan zoning ordinance.

## VII. PLANNING FOR MAJOR PROJECTS

Introduction
Certain types of activities can significantly impact coastal resources and create major changes within the Ketchikan coastal zone. Ketchikan is interested in participating in agency planning for large scale development projects and land management decisions. A consistency determination for a major project often takes place after the planning process is completed, which may mean that substantive decisions concerning the use have already been made. Conflicts that could have been avoided by mutual agreement early on become costly in terms of time and effort spent on resolving differences later on. To avoid this, major project planning establishes the following objectives:

- Ketchikan CMP policies should be considered as early as possible in planning for proposed major uses.

- Problems and potential consistency conflicts should be addressed and resolved prior to the application stage.
- Prior resolution of differences should speed the issuance of subsequent permits or approvals.

There are three procedures that are strongly encouraged for major activities of area-wide concern: (1) pre-application meetings, (2) permit application meetings, and (3) local partnership in planning activities. Participation in these procedures has the following objectives:

- Apply coastal management policies early in project or plan development
- Address problems and potential consistency evaluation conflicts prior to the permit or approval stage
- Speed up subsequent permits or approvals through early resolution of issues
- Ensure the compatibility of future planning projects with the approved Ketchikan CMP

Major Projects

The following types of activities and actions are considered to be major activities of regional concern:

- Oil and gas exploration, development, and support activities
- Land disposal and subdivision of land over 100 acres in size
- Transportation/utility facility and corridor designation or construction
- Mineral exploration or development (projects requiring development of new airstrip or roads, major energy generation or transmission facilities, slurry pipelines, port facilities, extensive overburden or tailings disposal areas, offshore mining, or significant stream diversion)
- Large scale sand, rock, and gravel extraction (greater than 25,000 cubic yards)
- Transportation, storage, cleanup, and disposal of hazardous substances (including the Defense Environmental Restoration Act Program and other federal sites)
- Development of management guidelines for subject uses and activities on National Wildlife Refuges, National Parks and Preserves, and State of Alaska Critical Habitat Areas
- Development of management guidelines for subject uses and activities on Native Corporation lands
- Industrial projects, including fish processing and petroleum product storage and transfer
- Construction or major additions to military facilities within the Ketchikan

Local Participation in Planning Activities

Local participation in state and federal planning activities that affect the allocation of resources in the Ketchikan coastal zone benefits everyone involved. State and federal agencies should invite representatives of the Ketchikan Planning Commission, coastal zone communities, and major coastal zone landowners and land managers to take part when conducting regional planning and resource allocation studies. The Ketchikan Planning Commission will assist in the identification of local representatives who are capable of ensuring that the plans that are developed accurately reflect local concerns and have credibility both in the Borough and in state government.

Pre-application Meeting Between Ketchikan and Applicant

At least 60 days prior to filing a permit application for a federal, state, or local permit or approval or proposing action on a disposal or management plan, parties involved in activities on the "major project" list are strongly encouraged to present a plan for activities to the Ketchikan Planning Commission and other participants in the consistency review process. This meeting is not part of a state-coordinated consistency review and is optional.

Developers of large industrial projects allow for sufficient lead time between their plan presentation to the Planning Commission and filing the permit application so that key issues can be addressed in project planning and permit applications submitted. It is recommended that presentations include the following information, which the prospective applicant may submit to the Ketchikan Planning Department in any format desired that conveys the following information clearly and in sufficient detail.

- **Project Description**. The description should consist of a narrative describing the proposed use or activity.
- **Site Description**. The description should include information about the property as it currently exists, including such items as size, exiting structures, vegetation, topography, and any other features that may be a factor in the design of or operation of the proposed project.
- **Owner, Sponsor or Developer**. The name of the agency, activity, business enterprise or person who will own the use should be provided, along with the name of other operators, if any.
- **Location and Size**. The location and size of the proposed project should be identified. A map, prepared at the most appropriate scale, and which may initially be hand drawn, should be provided showing the location of the proposed use and any structures, roads or alterations planned for the area. As the significance or complexity of the proposed project increases, the Ketchikan may, in its discretion, determine that professionally prepared maps and other documentation are needed at the time of application.
- **Construction Schedule**. The dates of any construction or other preparatory site activity should be given.
- **Operation Schedule**. The dates, times, and, if applicable, seasons of operation should be given.
- **Special circumstances**. Any special circumstances that exist that effect decisions made should be described.
- **Impact Assessment**. The prospective applicant's assessment of the impact on Ketchikan coastal zone resources that will be created by the proposed use should be given.
- **Statement of Consistency**. The applicant should provide a sufficiently detailed statement demonstrating that he or she has assessed the project against applicable Ketchikan CMP policies and believes that the proposed use is consistent with the Ketchikan CMP. Supporting material, such as studies and assessments supporting the prospective applicant's assertions, should be submitted to support any area where compliance is not apparent. Written justification for deviating from any applicable Ketchikan CMP policy should be provided in the event that the proposed use does not comply with one or more of the pertinent policies.
- **Mitigation Measures**. Any actions or measures that will be undertaken to bring a nonconforming proposed use into conformity with the policies of the Ketchikan CMP should be explained.

Ketchikan recommends that the applicant provide the following additional information in connection with proposed uses that are of large size, occupy a large land area, involve intensive activities, or are generally complex in nature:

- **Statement of Local, State or Federal Need**. Information supporting the public need and necessity for, and the benefit to be gained from, the project;
- **Alternative Sites**. Consideration of alternative locations outside the Ketchikan coastal zone.

- **Alternative Size and Scope**. Consideration of a reduced size and/or scope of the project.
- **Alternative Development Schedule**. Consideration of alternative construction and site preparation times.

Within 30 days of notification that an applicant would like to make a presentation, the CMP Coordinator will notify major landowners, the general public, and other consistency review participants and will work with these groups to hold the presentation meeting. As appropriate, discussions may follow the presentation to identify issues and conflicts that need to be addressed prior to permit review and preparation of the Ketchikan consistency comment. The CMP Coordinator and Planning Commission will be available to work with developers in project planning. The CMP Coordinator may provide a written summary to the developer outlining major consistency concerns and policy issues. Copies will be sent to OPMP and the coordinating agency. All pre-application meetings sponsored by the Ketchikan are open to the public, and public notice of the meeting will be provided. The Ketchikan CMP Coordinator will notify appropriate state agencies in advance and invite them to attend.

After the applicant's presentation, discussions will be held to identify issues and conflicts that need to be addressed prior to the submission of a formal application. Following the meeting, the Ketchikan CMP Coordinator will undertake additional pre-application work with the prospective applicant in project planning on request.

## VIII. AMENDMENTS AND REVISIONS

Every five years, the CMP Coordinator should initiate a local review of the approved coastal program. This formal review gives residents, developers, affected communities, and local landowners an opportunity to become familiar with the plan and its policies and to propose amendments. Changes can keep the Coastal Plan up to date and relevant. Some adjustments may be made to coastal zone boundaries or land use districts based on new information. Policies may be further refined and standards adopted to facilitate the consistency review process. More detailed plans developed for special areas, such as Areas Meriting Special Attention (AMSA), may be incorporated into the Ketchikan CMP after state and federal approval.

In addition, after completing any regional planning efforts, the Planning Commission may evaluate amending the Ketchikan CMP to include pertinent policies, classifications, and resource data developed through the specific planning process. The Ketchikan Assembly must approve all amendments to the Ketchikan CMP. The Commissioner of DNR and the federal Office of Ocean and Coastal Resource Management must also approve any amendment to the Ketchikan CMP. The process for amending the Ketchikan CMP is contained in regulations at 11 AAC 114.

Two processes are available to the Ketchikan for amending its plan. The minor amendment process quickly incorporates minor changes. The significant amendment process provides a more thorough review for important changes. Examples of changes that are a significant amendment to the Ketchikan CMP are:

1) New policies or changes to existing policies
2) Alteration to the coastal zone boundaries
3) AMSAs or ACMP special management areas
4) Restrictions or exclusions of a use of state concern not previously restricted or excluded

## IX. MONITORING AND ENFORCEMENT

AS 46.40.100 gives state resource agencies and municipalities enforcement responsibility for provisions of the Alaska Coastal Management Program. If an applicant fails to implement an adopted alternative measure or if the applicant undertakes a project modification not incorporated into the final determination and not reviewed under 11 AAC 110.800- 820, it is a violation of the Alaska Coastal Management Program. The responsibility for enforcing alternative measures carried on state and federal permits rests with the permitting agency. Ketchikan strongly encourages the state to enforce alternative measures and bring violators into compliance.

District policies and ACMP standards are implemented at the state level through alternative measures incorporated into the project description. The ACMP does not issue a separate coastal permit but relies on existing state authorities. Thus, state monitoring and enforcement of the ACMP occurs primarily through agency monitoring and enforcement of alternative measures on their permits. A district can assist in this process by monitoring projects and providing information to appropriate state agencies.

The CMP Coordinator and the Planning Commission have first-hand knowledge of local concerns and issues related to development activities. The CMP Coordinator and Planning Commission may, within legal and logistical constraints, assist agencies and municipalities in their monitoring and compliance efforts. The intent is to ensure that alternative measures associated with the Ketchikan CMP are carried out in the development process.

The CMP Coordinator is the key individual in monitoring projects to ensure that alternative measures are carried out in the development process. The CMP Coordinator and Planning Commission will rely on community input in monitoring implementation of alternative measures. Individuals, local governments, and landowners in the Ketchikan coastal zone may report suspected violations to the CMP Coordinator, Planning Commission, or state and federal resource agencies. The CMP Coordinator will investigate reports of violations and follow up with appropriate action to ensure state or federal enforcement. The CMP Coordinator and Planning Commission will work with state and federal agencies in monitoring and enforcement and provide responsible agencies with copies of local reports on noncompliance. This will include adherence to permit conditions, cooperative plans and the policies of the Ketchikan CMP.

If a subject use requires a local zoning permit or approval, the Borough will carry on its zoning permit all conditions placed on the subject use in the consistency determination. In such instances, the permitting state and/or federal agency will share concurrent jurisdiction with the Ketchikan coastal district and either or both may seek to enforce the conditions placed on the subject use.

## X. PUBLIC EDUCATION AND OUTREACH

The Ketchikan Coastal Program Coordinator is committed to understanding how coastal management can benefit communities and residents within borough boundaries and knows the most important way to gain this understanding is to listen to people. This local coastal professional also knows if coastal management is presented within the framework of local issues, concerns, and visions for the future, residents will be more likely to participate and support the program.

The Coastal Program Coordinator already has a general feel for local issues and sentiment and should encourage decision-making bodies and residents of the borough to use coastal

management as a way to identify areas appropriate for development, keep coastal resources healthy, and as a way to effect state and federal decision-making. The Coordinator also wants to ensure that local knowledge and public needs are heard and considered when local coastal resources and way of life might be affected by a development proposal. Here are some other education and outreach opportunities that the Coordinator may use to communicate about coastal management within the Ketchikan:

- Request general ACMP publications from OPMP and make sure these are available to local residents. The Coordinator plans to apply labels with local contact information to each of the these publications before putting them out in the borough office reception areas and his or her office.
- Use public service announcements (radio and newspaper), flyers, newspaper ads, and phone calls to encourage the input from residents during the review of projects.
- Encourage local residents to communicate with the coastal district coordinator about coastal issues.
- Talk to legislators about how the ACMP benefits the people, local coastal resources, and the local economy.
- Provide local news and volunteer to write articles for the ACMP website.
- Develop a borough coastal management web site and provide a link to the ACMP website. Once this website is regularly providing information considered important by locals, the Coordinator plans to develop a promotional strategy for getting the word out about this valuable information source.
- Train local teachers or other environmental educators about ACMP-related materials including the "Discover the Zone" game for kids.
- Be available for work in the schools, especially during Sea Week in the spring.
- Volunteer to serve as a mentor to high school students, especially if a local high school is participating in the annual National Ocean Sciences Bowl quiz game and research paper hosted at the Alaska SeaLife Center in Seward.
- Develop a presentation on the local coastal management program and the ACMP and pursue speaking engagements with different community organizations. The Coordinator plans to request assistance from OPMP to develop and, if appropriate, deliver this presentation.
- Participate in state, federal, and tribal natural resource planning efforts.
- Participate in watershed volunteer efforts and help them seek sources of funding.
- Encourage borough assembly and planning commission members to participate in education and outreach efforts, and provide them with the resources they will need to do this.
- Organize and participate in an annual beach clean up. If appropriate, coordinate this local effort with the international beach clean up held every year in September.
- Use OPMP as a resource.

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## Definitions

A number of the terms used in coastal management have specific regulatory or procedural meaning. To clarify the intent of the coastal management polices, the following definitions apply to language used in the plan policies.

**ACMP** is the Alaska Coastal Management Program.

**Active floodplain of watercourses** is the portion of a floodplain that is periodically inundated or encompassed by a mean annual flood (Q = 2.33 flood frequency) and is characterized by active following channels, high water channels and adjacent unvegetated or sparsely vegetated bars.

**Adjacent** has the same meaning as in State law.

**AMSA** has the same meaning as in State law.

**Aquatic Farming** means the growing, farming, or cultivating of aquatic plants, fish, or shellfish in captivity or under positive control to be sold or offered for sale.

**Avoid** has the same meaning as in State law.

**Base Flood** means the flood having one percent chance of being equaled or exceeded in any given year. Also referred to as the 100-year flood.

**Coastal Processes** are the collective results of physical, oceanographic, and meteorologic influences on the geographic landforms and nearshore waters of the Lake and Peninsula Borough. Coastal processes are also influenced by freshwater discharges from major river drainage systems and suspended sediments transported by rivers to coastal waters. Key features of coastal processes are shoreline erosion and accretion.

**Coastal Waters** has the same meaning as in state law.

**Consistency** means compliance with the standards of the ACMP, including the enforceable policies of this approved coastal plan.

**Consistent to the maximum extent practicable** means that federal government activities or uses, including development projects affecting the coastal zone of Alaska, are fully consistent with the standards of the ACMP unless compliance would violate another federal law (15 CFR 930.32.(a)).

**Cumulative Impacts** has the same meaning as in State law.

**DEC** is the Alaska Department of Environmental Conservation.

**DF&G** is the Alaska Department of Fish and Game.

**Direct and significant impact** has the same meaning as in State law.

**Development** means any man-made change to improved or unimproved lands and coastal waters, including but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling.

**DNR** is the Alaska Department of Natural Resources.

**Due deference** has the same meaning as in State Law.

**Environmentally Responsible** means consistent with coastal resource protection and performance standards of this plan, and incorporating current best management practices with protection measures commensurate with the values of habitats affected.

**Estuary** has the same meaning as in State law.

**Facilities related to commercial fishing and seafood processing** has the same meaning as in State law.

**Feasible and prudent** means consistent with sound engineering practice and not causing environmental, social, or economic problems that outweigh the public benefit to be derived from compliance with the standard which is modified by the term "feasible and prudent".

**Floodway** means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height, usually one foot, at any point.

**Geophysical Hazard** is a condition created by a geological process, topography, water drainage, or unique weather condition that presents a significant hazard to life and property.

**Important fishing areas** are areas used consistently over time for commercial, sport, or subsistence fishing. Fishing includes harvesting marine invertebrates and plants.

**Important habitats** has the same meaning as in State law.

**Local knowledge** has the same meaning given in State law except that "generally accepted by the local community" is that body of knowledge that is reflected in local plans, studies, policies and standards.

**Maintain** means to provide for continuation of current conditions and functions.

**Mariculture** is the captive cultivation of plants and animals in marine and estuarine waters for human consumption**.**

**Mean High Water** has the same meaning as in State law.

**Mean Higher High Water** is the average of all the daily higher high water recorded over a 19-year period or a computed equivalent period. It is usually associated with a tide exhibiting mixed characteristics.

**Mean Low Water** has the same meaning as in State law.

**Mean Lower Low Water** has the same meaning as in State law.

**Minimize** has the same meaning as in State law (see Avoid, Minimize and Mitigate).

**Mitigate** has the same meaning as in State law (see Avoid, minimize and Mitigate).

**Natural Hazards** has the same meaning as in State law.

**One Hundred Year Flood** is a flood of a magnitude, which can be expected to occur on an average of once every 100 years. It is possible for this size flood to occur during any year, and possible in successive years. It would have a one percent chance of being equaled or exceeded in any year. Statistical analysis of available stream flow or storm records, or analysis of rainfall or runoff characteristics of the watershed, or topography and storm characteristics are used to determine the extent and depth of the 100-year flood.

**OPMP** is the Office of Project Management and Permitting with the Department of Natural Resources.

**Ordinary high water** has the same meaning as in State law.

**Practicable** has the same meaning as in State law.

**Proper and improper uses** are the can-do and can't-do uses for the area.

**Public need** has the same meaning as in State law except that "documented" includes those needs expressed in locally adopted plans, studies, policies and standards.

**Reasonable Use** (of property) means a use consistent with local zoning and special area plans and local knowledge. Reasonable use does not mean developed to the maximum extent practicable.

**Resource agency** has the same meaning as in State law.

**Saltwater wetlands** has the same meaning as in State law. (see also "wetlands")

**Shall** means mandatory; it requires a course of action or set of conditions to be achieved.

**Should** states intent for a course of action or set of conditions to be achieved. This implies that case-specific discretion may be applied for achieving the intent of the action.

**Significant adverse impact** means an impact as indicated in state law by "direct and significant impact".

**Subject uses** is a description of the land and water uses and activities which are subject to the district plan.

**Subsidence** is a lowering in elevation of ground surface due to underground geologic or hydrologic change. It can be a common occurrence in areas susceptible to seismic activity and where excessive water table depletion occurs.

**Subsistence Use Areas** are coastal habitat areas, used traditionally or occasionally in response to seasonal or cyclic resource abundance, where subsistence harvests of fish, wildlife, and other biological resources are conducted.

**Subsistence uses** has the same meaning as in State law.

**Surface Waters** include streams, rivers, ponds, lakes, and contiguous open water wetlands.

**Tsunami** is a great sea wave produced by submarine earth movements or volcanic eruption.

**Uses of state concern** has the meaning as in State law.

**Water-Dependent** has the same meaning as in State law.

**Waterfront** means the area along the coastline between mean higher high water and mean high sea level.

**Water-Related** has the same meaning in State law.

**Wetlands** has the same meaning as in State law.

# Appendix A – Enforceable Policies

**Definitions are provided in the preceding section (refer to page 147).**

## Coastal Development

### CD-1: Prioritization of Waterfront Land Use

A. Water-dependent uses include: fish hatcheries; mariculture activities; fish processing; log storage and transfer; float plane bases, boat harbors, freight, fuel, or other docks; marine-based tourism facilities; boat repair, haul outs, marine ways, and accessory attached housing; remote recreational cabins dependent on water access; and facilities that serve as inter-modal transportation links for the transfer of goods and services between the marine transportation system and the road system.
B. Water-related activities include: marine retail stores and commercial activities such as hotels, restaurants, and other similar uses that provide views and access to the waterfront.
C. Uses and activities that are neither water dependent or water related for which there is not practicable inland alternative shall be located in sites where water-dependent or water related uses or activities are not practicable due to shallow bathymetry or unusual lot characteristics such as substandard size, frontage, or steep topography.

### CD-2: Structures Placed in Navigable Waters

Placement of piling-supported or floating structures in coastal waters shall be subject to the following standards:

A. Use of structures shall be consistent with the allowable uses on the adjacent uplands.
B. Structures shall not be treated with exteriorly applied creosote preservative coatings.

### CD-3: Tideland Fill Below Mean High Water

Piling supported or floating structures shall be used for construction below mean high water unless clear and convincing evidence shows that all of the following conditions exist. For the following conditions, "reasonable use" means consistent with local zoning and special areas plans. "Reasonable use" does not mean developed to the maximum extent practicable.

A. There is a documented public need for the proposed activity as expressed in locally adopted plans, studies, policies, standards, public opinion surveys and public testimony.

B. There are no practicable inland alternatives that would meet the public need and allow development away from the waterfront.
C. Denial of the fill would prevent the applicant from making a reasonable use of the property.
D. The fill is placed in a manner that minimizes impacts on adjacent uses, public access easements along the shoreline and water views as identified on Map Figure 3.35;
E. The fill is the minimum amount necessary to establish a reasonable use of the property; and
F. Development of the property would support a water dependent use.

## Recreation and Coastal Access

**Designations are mapped and described in detail in Volume 2, pp 19-29 and 51-59. This information is duplicated in Volume 1, Part Two. Federal lands are excluded from the designated areas.**

### RCA-1: Management of Designated Recreational Areas

Proposed uses or activities in the Designated Recreational Areas as depicted on the maps titled Areas Designated for Recreation Use (Figures 3.2-3.33) shall avoid or minimize direct and significant impacts upon the existing activities and the physical, biological, visual or cultural features upon which the recreation depends (shown as protected features in the table 4.2 of Designated Recreational Areas.)

### RCA-2: Visually Important Backdrops and Visual Point of Interest within the Clover Pass Area

Designated Visually Important Backdrops and Points of Interest are depicted on Map Figures 3.2, 3.7-3.13, 3.27 and 3.33 for the Clover Pass area. Scenic impacts to important backdrops and points of interest within the Clover Pass Area shall be avoided or minimized through use of coastal development best management practices included in volume1. Site clearing and re-grading of important backdrops and points of interest within the Clover Pass Area shall be minimized to the extent practicable.

### RCA-3: Recreation Buffers

Designated sites for lodges, resorts and marinas in the designated recreational use areas are depicted on Map Figures 3.10, 3.12, 3.21, 3.24, 3.27, 3.28 and 3.31-3.33. Natural or vegetative buffers shall be required on these sites to avoid or minimize conflicts and protect views. Requirements for the size and extent of buffers shall be determined on a case by case basis and shall be commensurate with the reasonably foreseeable impacts of the development on adjacent uses and activities.

### RCA-4: Whitman Creek

As depicted on the map titled Areas Designated for Recreation Use (Map Figure 3.25), George Inlet near Whitman Creek is designated as a Recreation Use Area for the Tongass Coast Aquarium. Uses and activities within the designated area shall be sited to avoid, minimize, or mitigate impacts to operations and public access to and around the aquarium site.

### RCA-5: Public Access to Coastal Water

Within designated recreational use areas that are adjacent to coastal water (map figures 3.2-3.16, 3.20-3.30, 3.32-3.34), it shall be considered appropriate to increase public access from the uplands within the designated recreational use area to, from, and along coastal water through easements, dedications, or other means of conveyance, except where human health or safety would be at risk.

### RCA-6: Public Access in Designated Areas

Within designated recreational use areas (map figures 3.2-3.33), water access to, from and along lakeshores, streams, shorelines, tidelands, estuaries and saltwater wetlands for recreational use shall be increased, through easements, dedications, or other means of conveyance, except where human health or safety would be at risk.

### RCA -7: Waterfront Access

In accordance with 11 AAC 112.220, capital improvements on or adjacent to publicly-owned waterfront property shall be designed to maximize pedestrian access, views to and along coastal waters, and to facilitate public enjoyment of coastal waters. These improvements shall incorporate to the extent practicable promenades, shelters, viewing platforms bike lanes, rest-stops, cultural and geographic interpretive signage, picnic facilities, landscaping and other amenities to enhance public enjoyment of coastal resources. The following types of capital improvements are exempt from this policy: utility transmission lines, and utility pipelines.

# Energy Facilities

**Designations are mapped and described in detail in Volume 2, pp 60-62. This information is duplicated in Volume 1, Part Two. Federal lands are excluded from the designated areas.**

## EF-1 Designated Energy Improvements

The following sites suitable for development of major energy facilities are shown on Map Figure 4.1 titled: Areas Designated for the development of major energy facilities. Preservation of transmission corridors, power generation site uses, and related activities shall be considered the primary uses in the following areas. These areas shall be managed and developed with the recognition that power generation uses will be maintained and expanded.

A. Hydroelectric facilities at Swan Lake, Beaver Falls, Silvis Lake, the Ketchikan Power House, Upper Mahoney Lake and Upper Mahoney Creek near Ketchikan.
B. Diesel power generation at the Bailey Diesel Plant.
C. The Swan Lake-Lake Tyee Intertie consisting of a transmission line from Ketchikan to the Petersburg/Wrangell area including the proposed right-of-way.
D. A new transmission line to Annette and Gravina Islands.
E. Connell Lake Dam, pipeline, and generating facilities at Ward Cove.

# Appendix B – Administrative Policies

Under AS 46.40.210(7), a district coastal management plan is a plan that sets out policies and standards, including enforceable policies, "to guide public and private uses of land and water within that district ..." Ketchikan has chosen to include two other types of policies: Administrative Policies and Best Management Practices. For a definition of these terms, refer to the definitions section. These two alternative management tools are policies that may not meet one or more tests of enforceability contained in state statute but that can nonetheless help guide coastal uses. Administrative policies and Best Management Practices perform several functions:

- offer an implementation option, although not a requirement, for state or federal agencies in decision making;
- support other planning efforts within the Borough;
- provide direction to Ketchikan in implementing its coastal management plan; and
- encourage increased cooperation between the community, private industry, and state and local government.

**Coastal Development Administrative Policies**

**CD-4: Transitional Areas**

The following areas are identified as areas in transition for which thorough planning is indicated or, that may become special area management plans or designated Areas that Merit Special Attention.

A. Clover Pass

B. Upper George Inlet/Shelter Cove

C. Ward Cove

D. Pennock Island

E. George Inlet – Mt. Point to Mahoney Creek

F. Point Higgins

**CD-5: Priority Locations for Industrial, Commercial, and Residential Expansion**

The following areas are identified as priority locations for major land and water uses and are depicted on the map titled: Priority Locations for Industrial, Commercial, and Residential Expansion.

A. Industrial Uses: Ward Cove, White River, the south and north ends of the Airport Reserve and the waterfront between Refuge Cove and the Saxman Seaport.

B. Commercial Uses: Ward Cove, White River, Knudson Cove, Herring Bay, Gravina Island north of the airport and the waterfront located on Revillagigedo Island between Refuge Cove and the Saxman Seaport.

C. Residential Uses: Lands that are needed for expansion of residential and recreational homesite uses. The remote lands off the road system include Moser Bay, George Inlet, Vallenar Bay, Carroll Inlet, and Clover Pass north of Settler's Cove State Park. Urban residential land includes the Point Higgins area, Clover Pass south of Settler's Cove State Park, Gravina Island north of the airport (new road under construction) and the bench lands south of the City of Ketchikan.

**CD-6: Local Applicability of the KGB Coastal Management Plan**

During consideration of property rezoning, conditional uses, variances, and subdivisions, and other judicial or legislative actions related to land use, the Ketchikan Gateway Borough will review projects for consistency with the provisions and policies of the Ketchikan Gateway Borough Coastal Management Plan, in addition to any other local requirements.

**CD-7: Management of Borough-Owned Land**
Consider the strategic value of Borough-owned waterfront property to provide for future water-dependent and water related development needs prior to leases and land sales

**CD-8: Consistency with Local Ordinances and Plans**
In order for development proposals to be found consistent with the Ketchikan Gateway Borough Coastal Management Plan:
A. The subject property must be free of violations of the Ketchikan Gateway Borough Code of Ordinances.
B. The proposed development is consistent with the Ketchikan Gateway Borough Code of Ordinances, particularly:
1) The standards set forth in KGB Title 60 Zoning
2) The standards set forth in KGB Title 55 Subdivisions
3) The standards set forth in KGB Code Section 60.10.076 Flood Damage prevention standards for the Floodways and Floodplains, including the coastline, identified in the FEMA Maps.
C. The proposed development is consistent with the existing Comprehensive Plan and Area Plans.

**CD-3: Fill Above Mean High Water**
Placement of solid fill material above mean high water upon legal lots along coastal waters shall be allowed when placement of the fill is the only means to allow reasonable use of the property. The applicant shall identify Mean High Water in accordance with DNR or Borough procedures. Finished grade shall be 22' above Mean Low Water (MLW) to minimize property damage from flooding.

**CD-5: Tidelands Development**
Placement of structures or dredged or fill material into coastal waters including tidelands shall maintain
unobstructed navigational access of adjacent waterfront property owners

**RTC-6 Increased Public Access**
New subdivisions on State, University, Mental Health Trust and Borough lands shall increase public access to, from and along coastal water at all tide stages .

**Recreation Administrative Policies**
**RCA-8** The Ketchikan Coastal District will encourage the State and Federal governments to appropriately classify and manage for recreational use, the areas identified in REC Map-1 and REC Table-1 that lie within their jurisdiction.
**RCA-9** The Ketchikan Coastal District will work with native corporations, and the Mental Health and University Land Trusts to protect and maintain the recreational use of areas identified on the map titled: Areas Used for Recreation and Tourism (and those illustrated in figures 3.2-3.34) that are in their ownership, and pursue acquisitions of these where necessary or desirable through land trades and purchases.
**RCA-10** Disposition of Borough lands will include provisions for continued public access to and along the waterfront.
**RCA-11** The Borough will identify and designate community interest lands in order to maintain access to important recreation resources.
**RCA-12** The Borough will develop a coordinated sign program to identify recorded public access easements and rights-of-way.
**RCA-13** Construction of an additional recreational and commercial harbor facility is encouraged in and/or adjacent to Tongass Narrows to meet excess demand between Survey Point and Mountain Point.
**RCA-14** Public boat, canoe, and kayak launching facilities will be improved and increased throughout the road system.
**RCA-15** The Parks and Recreation Plan will be used as a guide for facility development and programming.
**RCA-16** The Ketchikan Trails Plan will be implemented as funding allows.
**RCA-17** The Deer Mountain Trailhead will be protected, improved, and buffered from views of the adjacent landfill.
**RCA-18** The USFS is encouraged to be the primary provider of primitive and semi-primitive recreational opportunities for Borough residents. The USFS is further encouraged to expand such opportunities.
**RCA-19** The Alaska Division of Parks is encouraged to maintain and develop regional park facilities.

### Commercial Fishing and Seafood Processing Administrative Policies

**CFS- 1** The Borough will promote and support industry growth and diversification through State and Federal permit review and appropriate zoning as follows:

A. Support Borough selection of the Neets Bay hatchery site for lease to Southern Southeast Regional Aquaculture Association

B. Increase opportunities for transportation links and support facilities to get fresh fish to markets and processors.

C. Study feasibility of a publicly owned and leased cold storage facility.

D. Encourage the private development of support facilities such as bunkhouses or parking areas needed for seasonal employment.

E. Support monitoring water quality to understand impacts of waste discharges.

F. Support efforts to find alternative methods to in-water fish waste discharge including alternative processing methods for production of other products such fish meal, fertilizer, and fish oil.

G. Identify and designate land suitable for seafood processing.

H. Develop needed infrastructure such as harbors, cold storage facilities, gear and equipment storage, warehousing and utilities.

### Transportation and Utilities Administrative Policies

**TU-3: Utilities**

Activities that preclude the following utility routes and facilities as shown on Map Figure 6.1, for which there is no practicable inland alternative to meet the public need, shall be avoided.

A. Connell Lake dam and pipeline to provide a community water and power source

B. Water and sewer line north to Peninsula Point

C. Water line south to Saxman

D. Increased capacity of water line to airport and Gravina Island

E. Water line from airport to the northern boundary of the airport reserve

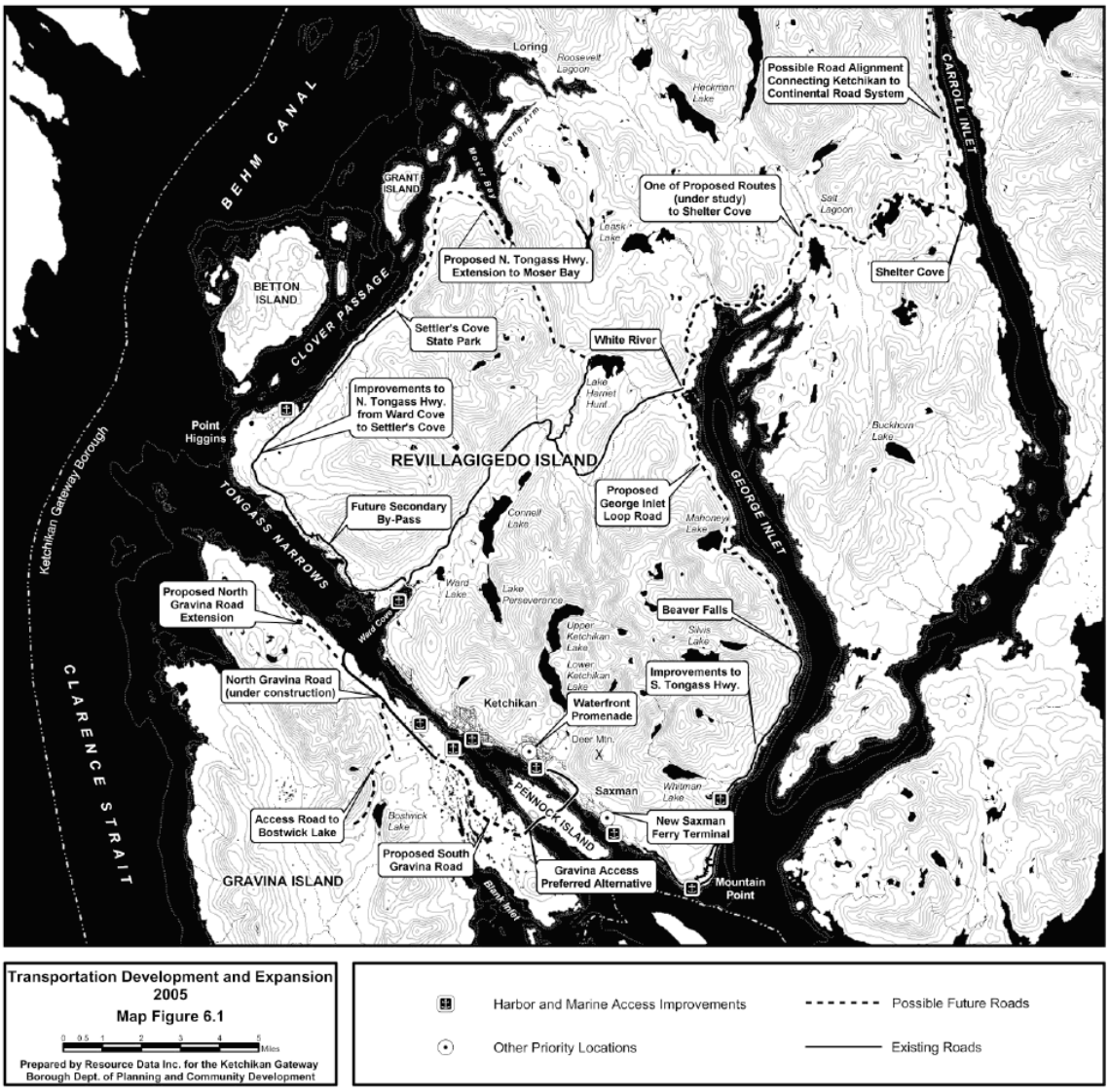
**TU-4** The Forest Service, in conjunction with resource development, is encouraged to develop a recreation-standard road system in upper Carroll Inlet.

**TU-5** The USFS and the State Department of Natural Resources are encouraged to maintain an open road system to Bostwick Lake on Gravina Island after completion of timber harvests. Additional post harvest road management will be negotiated among the Borough, USFS, and the State Department of Natural Resources.

**TU-6** The Borough will obtain funding and begin construction of priority sewer system improvement projects.

**TU-7** The Borough will coordinate the installation of water/sewer vaults with road construction projects.

**TU-8** The Borough will develop a long-term plan for solid waste and coordinate landfill planning with landfill plans of other groups.




## Coastal Habitats Administrative Policies

**H-1** The Borough will develop a wetland management plan, covering the roaded area of the Borough, the east side of Gravina, and Pennock Island, that establishes a local land use development process consistent with the requirements of the Clean Water Act with the intent to administer certain categories of wetland permits.

**H-2** The Borough will give priority to development of previously impacted areas on the road system and on Borough lands north of the airport, since these areas generally have lower habitat values and will be less adversely impacted by development than undeveloped areas.

## Cultural, Historic, and Archaeological Administrative Policies

**CHA-1** The Borough will promote historic building re-use, renovation, and maintenance.

**CHA-2** Historic revitalization of Creek Street, Stedman Thomas neighborhood, the downtown, Hopkins Alley and adjacent Water Street is encouraged.

**CHA-3** Maintenance and restoration of the historic character of Ketchikan's boardwalks, tunnel, and stairways are encouraged.

**CHA-4** Pennock Island graveyards will be protected by seeking designation of the area as a "National Historic Site."

# Appendix C – Best Management Practices

## *Coastal Development Best Management Practices*

CD-10: Docks and piers should be consolidated to minimize impacts to shoreline access, shoreline views and navigation.

CD-11: New development should incorporate existing vegetation or landscaping within and around the property to minimize impacts from potentially conflicting uses.

CD-12: Subdivision Design Guidelines, as illustrated in the Gravina Island Plan: Citizen's Guide to Public and Private Decision-making, should be considered during the review of all new waterfront residential subdivisions.

CD-13: New coastline development should be carried out subject to a site development plan (prior to clearing, dredging, grading, filling and other site work) that addresses long term use and development of the entire parcel and, when appropriate, neighboring properties.

CD-14: Extensive site grading and rock retaining walls should be minimized in shoreline development in favor of posts or piling construction, where appropriate.

CD-15: Access improvements (driveways, docks, stairs/boardwalks, etc.) should be shared to the extent possible in order to save cost, protect natural beauty, and protect habitat.

CD-16: Clearing natural vegetation within the beach fringe should be minimized to maintain ecologic diversity and the abundance of plants and animals.

CD-17: Non-water dependent buildings and structures should be setback from the shoreline to protect views of adjacent owners, enhance public movement along the shore and protect natural beauty.

CD-18: The flow of natural creeks and drainage channels should be maintained, thereby preventing erosion and flooding.

CD-19: Wastewater from sewage and runoff (from buildings, driveways, etc.) should be kept out of the sea by appropriate site grading and landscaping and by regular maintenance of sewage treatment systems.

CD-20: Shorelines are visually sensitive parts of the landscape and have low screening ability, therefore, derelict vehicles, piles of building materials and other clutter should be kept upland, screened by vegetation.

### Natural Hazards Best Management Practices

**NH-1: Development in Potentially Hazardous Areas** All excavation or fills should be so constructed that they do not endanger life or property. The Borough Manager or designee may require the applicant to prepare a soils and geology engineering report based upon his/her determination that the condition of the soils is unknown to the extent that such additional information is required to protect the public health safety and welfare. Such a report should be based on adequate and necessary test borings and shall contain all the information listed below. Recommendations included in the report and approved by the Borough Engineer should be incorporated in the development plans and/or specifications.

A. Data regarding the nature, distribution, strength, and erodibility of existing soils.
B. If applicable, data regarding the nature, distribution, strength, and erodibility of soil to be placed on the site.
C. Recommendations for earthwork procedures.
D. Recommended designs for interim soil stabilization devices and measures, and for permanent soil stabilization after construction is completed.
E. Design criteria for corrective measures when necessary.
F. Recommendations covering the stability of the site.

**NH-2** Due to the unstable geologic conditions in certain areas of the Borough, applicants should conduct geotechnical investigations prior to development to determine appropriate siting, design, and construction measures.

**NH-3** Developers and builders of facilities should design and construct in accordance with the Uniform Building Code requirements for Seismic Zone 2B.

**NH-4** Construction below 22' in elevation above sea level may be subject to flooding and storm surge. Developers and builders are encouraged to refer to FEMA maps or consult FEMA in areas that have not been mapped.

### *Recreation Best Management Practices*

① *The "community center" is situated on prime water frontage around shared docking facilities.*
② *Long, narrow shape maximizes number of lots with water frontage. Non-waterfront lots all have "nature" views. The compact layout minimizes road development costs.*
③ *The pedestrian trail system provides convenient access to the water from all lots.*
④ *The creek corridor and estuary are kept natural as part of the open space system.*
⑤ *The shoreline easement allows all residents to walk along the coast.*


**RCA-20** All new subdivisions should provide recreational areas and public access to and along these areas and to beaches, trails, lakes and roadways.

**RCA-21** Where practical, all waterfront development should incorporate both pedestrian and recreational boating access to and along the water. Where such access is inappropriate for safety and use conflict considerations, opportunities for viewing and passive enjoyment of the "working waterfront" should be included. Where none of these are desirable, landscaping, exterior lighting, siting and building design elements should be employed to mitigate impacts and maintain and enhance nearby recreational opportunities.

**RCA-22** Uses and activities associated with cruise ship tourism should be sited, timed and operated in consultation with the Borough so as to minimize conflicts.

### Transportation and Utilities Best Management Practices

**TU–9** Sealed vault privies should be used in remote subdivisions to minimize marine outfalls and to protect adjacent water quality for other uses.

### Coastal Habitats Best Management Practices

**H-3** Disturbance of tidelands should be minimized. Operation of machinery and equipment on tidelands should be contained in the smallest area practicable.

**H-4** To the maximum extent practicable, fill should be placed on tidelands only when exposed by lowered tides.

**H-5** Natural drainage patterns should be maintained, to the maximum extent practicable, without introducing ponding or drying. Appropriate ditching, culverts, and other measures should provide control of drainage.

**H-6** Explosives should be discharged in a manner that is not likely to adversely impact wintering herring or other fish inhabiting the area. The Alaska Department of Fish and Game should be contacted for information concerning timing (typically between March 16 through October 1) and operational constraints.
**H-7** Any water intake structure in salmon bearing waters, including a screened enclosure, well-point, sump, or infiltration gallery, should be designed, operated, and maintained to prevent fish entrapment, entrainment, or injury, unless specifically exempted by ADF&G.
**H-8** In-water construction activities involving the dredging and deposition of fill, and pile driving should abide by reasonable timing restrictions set by ADF&G (typically March 1 to June 15).
**H-9** A minimum 50-foot buffer of undisturbed naural vegetation should be maintained from the ordinary high water mark of anadromous fish streams. The buffer should be maintained for all uses and activities except: timber harvest activities governed by the Forest Practices Act; transportation and utility corridors; bridges; water dependent uses; and activities related to the research, protection or enhancement of anadromous fish and their habitats.
**H-10** Development activities should avoid raptor nesting. The U.S. Fish and Wildlife Service and the Alaska Department of Fish and Game should be contacted for information concerning the known locations of raptor nest sites and appropriate criteria to minimize significant adverse impacts to nest sites and nesting activity.

### Cultural, Historic, and Archaeological Best Management Practices

**CHA-5** The potential impacts of development on historic or archaeological resources should be evaluated by the applicant early in project planning. The applicant should consult with the State Historic Preservation Office and the Borough Planning Department to assess the potential impacts to cultural and historic resources and identify appropriate measures to protect and preserve the resource.
**CHA-6** Where there is potential for undiscovered archaeological or historic sites in the project area, if recommended by the Borough and the State Historic Preservation Officer, the applicant should conduct a reconnaissance-level resource survey prior to surface disturbance. A reconnaissance-level resource survey is an extensive “walk-over” conducted with little or no subsurface testing. A reconnaissance survey is only a sampling which may locate some (but not all) of the properties which could be affected by a project and allow an evaluation of their significance.
**CHA-7** The applicant should notify the State Historic Preservation Office, the surface and subsurface landowners, and the Borough if previously undiscovered artifacts or areas of historic, prehistoric, or archaeological importance are encountered during development. The site should be protected from further disturbance pending evaluation by a qualified cultural resources specialist. Such an evaluation should be completed without delay and is the responsibility of the applicant.
**CHA-8** All obvious gravesites should be avoided. In case of a discovery of human remains, work that would further disturb the remains should stop immediately. The discoverer should contact a law enforcement officer, the Borough, the surface and subsurface landowners, the appropriate Native organization, and the State Historic Preservation Office.